

**Medicine
and
The Stanford University
School of Medicine**

circa 1932: The Way It Was

David A. Rytand, M.D.



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by David A. Rytand, M.D.
Arthur L. Bloomfield Professor of Medicine, Emeritus

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The Hewlett Award and David Rytand

Several years ago, the department decided that it wanted to select and honor a few who have touched Stanford and represented the epitome of investigator - clinician - teacher. This award was to go to someone who not only was able to carry out in every day ways all three of the functions expected of a theoretical academician. We also gave the potential recipient a fourth task - he/she had to apply the scientific information about medicine in a sensitive and humane way to patients.

We appointed a committee to name the prize. It was no mistake that David Rytand was asked to chair that committee. He knew Stanford well; he understood the conditions of the prize; and he was much too modest to focus on his own characteristics during the search. Albion Walter Hewlett's name floated far above others on a long list. As David said, "Hewlett's achievements produced a sense of majesty, history and respect." In his 51 short years Hewlett had demonstrated beyond a doubt what we were trying to find in others.

Dr. Saul Rosenberg, as our first recipient of the prize, set high standards. The committee's selection of David Rytand cements those standards and makes the choice of successor a formidable task. By virtue of the first two choices, the fate of this prize has been sealed; it will be given to few. But when it is given, those who witness the presentation and reflect on the prize will feel the deep commitment of the department to provide the environment and the statement of goals for which only the finest institutions could dare to hope.

by Kenneth L. Melmon, M.D.
Arthur L. Bloomfield Professor of Medicine
Chairman, Department of Medicine

Thoughts about David Rytand on the occasion of the Hewlett Award, 1984

Being around David Rytand, one is struck by his youth, his vitality, his enthusiasm. It is hard to believe that he has been around long enough to achieve "legend-in-his-own-time" status. But this, surely, he has. In just two more years Dave will have completed 60 years of loyal and productive commitment to Stanford as undergraduate, medical student, house officer, and faculty. He was the first professor in the school of medicine to hold an endowed chair. Now we have 24. Dave was the first Arthur L. Bloomfield professor of medicine, meaning that he was chosen to personify a specific Stanford legacy of clinical, teaching and investigative excellence. He was the chairperson of the department of medicine during the critical years immediately preceding and following the move from San Francisco. He has had a profound influence on a full half century of medical students, residents, colleagues, referring physicians and, most important of all, patients.

What about Dave's contributions to the progress of medicine? I will not elaborate on his prominence or presidency in 14 learned societies, his distinguished service awards, the number of his publications -- all the right stuff that fills C.V.'s, because none of these things help anyone achieve immortality. To achieve immortality you must accomplish certain goals. This Dave has done. I will mention a few.

First, you must discover a basic law of nature. Rytand's law, as it now is known, was discovered in 1951: "The prognosis for a patient with myocardial infarction is worse when anticoagulants are given to someone else." The "law" represented Dave's wry comment on the faults inherent in a large scale controlled therapeutic trial. Critical analysis is commonplace today, but in the 1950s, Dave's critique was virtually the sole dissent against the widespread use of anticoagulants in M.I. Many investigators manipulate science to show what must be true, ought to be true, or rather

what they wish to be true. Dave always believed that science should show what *is* true. There is a difference.

Another law of Rytand was his discovery, in 1938, of the constant relationship of glomerular size and number to kidney and body mass throughout mammalian species. Dave's interests always have been legion, but to pin this one down he had to extend his focus beyond the usual mice and rats to include an elephant autopsied at the San Francisco Zoo.

Now, the second rule of immortality: you must have a disease named after you. Dave described nine patients with a unique late diastolic murmur associated with calcification of the mitral annulus and A-V block in 1946. This is known variously as Rytand's murmur or Rytand's syndrome, depending on which textbook you use, but we prefer "la maladie de Rytand" as it is described in the French literature. Ultimate immortality results when the disease achieves abbreviation status. We trust this will be known to posterity as "la m de R."

Two other major contributions should be noted. First was a series of papers describing nephrotic syndrome following bee sting or poison oak, and periarteritis nodosa following the dermatitis of poison oak and primrose. These were the first immune diseases known to be precipitated by plant and insect toxins.

Second were Dave's many contributions to the study of atrial flutter. Dave did not invent the circus movement, but he certainly would have if Sir Thomas Lewis had not done so previously. Dave's discovery of slow flutter rates with a large right atrium and his many other electrocardiographic and canine observations added considerable data to support this then tenuous theory.

So we get here a sense of Dave's uniqueness. Who else would or could report a 40-50 year follow-up of six patients with postural proteinuria, to show the benign nature of this disorder, as Dave did in 1981? Who else would score right on with two of the most abstruse CPC's in the *New England Journal* history, as did Dave with Wegener's granulomatosis

in one and myocardial amyloidosis in another in 1974 and 1975?

This barely scratches the surface because Dave's published work has embraced a wide range of research including man and animals, many organ systems, experimental and bedside observation, and many disciplines from genetics and anatomy through physiology and pharmacology to pathology and therapeutics.

Of all this, when asked in a recent interview to describe what he took to be his greatest achievements, Dave answered simply, "Two things. I taught students. And I listened to patients." By which he meant: to determine their needs as ill persons. This brings us to the heart of the Hewlett award which is designed not just for a colleague with unique scholarship but one who brings his or her skills and knowledge effectively to the care of patients. This Dave most certainly did in the two ways he briefly mentioned. He spread his wisdom, his experience, and his enthusiasm for clinical medicine through two to three generations of medical students and residents. He cared personally and responsibly for thousands of patients, including his meticulous follow-ups and inimitable phone calls to referring physicians.

Dave, we respect you, of course, as an eminent cardiologist. But we do not think of you so much as a cardiologist, or even as a general internist. We think of you as physician in all that this implies - primarily the welfare of the person who is now your patient as your paramount consideration. We love and respect you as a human being, a friend, and a colleague. We have been most fortunate to have you with us all these years. We wish you many more, and we are proud to bestow on you the Hewlett award which you so readily deserve.

by Allen B. Barbour, M.D.
Professor of Clinical Medicine, Emeritus

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Introduction

The following is not intended as a formal history either of medicine in general or of Stanford University School of Medicine in particular. Rather, it presents an informal view of what both were like when my internship on the medical service of Professor Arthur L. Bloomfield in Stanford's Lane Hospital on San Francisco's Clay Street commenced July 1, 1932. My first patient to die did so exactly one week later, of subacute bacterial endocarditis and endarteritis on a patent ductus arteriosus. Let any young people who read on be warned that fifty years hence they too will look back on the methods available to them today as comparably archaic. Further, even a scan of volume 207 of the *New England Journal of Medicine* for 1932 and glances through the American Medical Association's *Useful Drugs and New and Nonofficial Remedies* of the 1930's will show that medicine at Stanford then was not backward despite geographic isolation.

The start of that internship, then required by Stanford for the M.D. degree, and conveniently just a half century ago, followed four years of medical education and initiated four of training. It seems reasonable, then, to start this account with a look at our medical school of 1928-32, with no attempt to praise "the good old days" or to denigrate them.

Lane Library's file of the *Stanford University Bulletin*: "School of Medicine Annual Announcement" has been an indispensable aid to a failing memory. The series entitled *Annual Report of the President of Stanford University* also has been a useful guide.

The Johns Hopkins University Press and Dr. A.M. Harvey kindly gave permission to reproduce the section on Addis' lab from Harvey AM. *Science at the bedside: clinical research in American medicine, 1905-1945*. Baltimore: The Johns Hopkins University Press, 1981. The Association of American Medical Colleges kindly granted permission to reprint George

D. Barnett's article, "The introductory course in clinical medicine." *J Assoc Am Med Coll* 1938; 13: 225-7.

Many classmates and friends have helped, but are not responsible for remaining errors or omissions. They include S.C. Bonar, R.B. Cohn, A.J. Cox, Jr., W.P. Creger, W.W. Greene, L.E. Heiges, Jr., D.C. Hines, M.A. Krupp, G.B. Robson, B. Shenson, A.W. Snoke, and F. R. Wheeler.

A great many thanks are owed to Kenneth L. Melmon, the third Arthur L. Bloomfield professor of medicine, for his stimulation and strong support. In his office, Teresa Terry kindly transformed an almost illegible manuscript into a sparkling typescript.

Admission to the School of Medicine

The entering class was limited to 50 students who had: (1) graduated from high school; (2) completed three full college years including approximately one of physics, one of biology, and three of chemistry including inorganic, quantitative analysis and organic; and (3) a little English and a reading knowledge of French or German.

In the late 1920's, Stanford University was known appropriately and cordially as "the farm" (literally that of the late founder and California senator, Leland Stanford). It was a relatively bucolic and friendly place populated largely by young men from the San Francisco and Los Angeles areas. The number of undergraduate women was limited to 500 by the founding legacy.

Stanford undergraduates heading for medical school were familiar with each other as well as to the campus faculty. Some of us applied solely to Stanford and were interviewed by Professor George DeForest Barnett. The rumor was that if he liked a student, that person was accepted. Rumor true or rumor false, one wonders whether the modern laborious methods really are any improvement over an arbitrary selection by a sage professor-clinician. Of course, the problem of selection was not very great at that time. Although no records of the number of applications for my class could be found, files show that only 161 applied five years later.

Our admitted class of 48 contained 41 California men, of whom but two were married. Thirteen already had the A.B. or B.S. degrees: four from Stanford, five from other California schools, two from the state of Washington, and one each from Oregon and Pennsylvania. Of those starting, seven dropped out and were replaced before the second year began. The one woman contracted tuberculosis but graduated later; the one Chinese man died of pneumonia while an intern.

The Preclinical Sciences

Most of our undergraduate class were in a hurry, either because we were of the depression years or of our eagerness to get on with it, to enter the school of medicine as soon as possible. This translated to entry into medicine after three years, with an A.B. in preclinical science after the first year of medical school on the campus. That first year was comprised entirely of anatomy, physiology, and biochemistry in heavy doses.

Anatomy absorbed much of our time (almost two-thirds of that first year) and was the object of most of our fears. In the sweet-fetid odor of the old anatomy building, we were assigned two to a cadaver and told to start work. In company with the bright young students of those Harvey Cushing days, I was to become a neurosurgeon. Countless prospective patients were spared when Professor A. W. Meyer assessed my first week's work with the highly accurate diagnosis, "You butcher!" "Danny" Danforth may have been just as discerning but was less blunt about it as we went about endlessly dissecting subcutaneous nerves (on which someone in the department was doing a thesis), finding bursae, learning a new vocabulary, and memorizing names of bones, muscle insertions, and foramina. It was a powerful introductory discipline in learning, but gross anatomy never was one of my strong points. Yet there remains a vague feeling that the curricular pendulum later went too far, and that today's students might benefit from longer exposure to what now is "structural biology." Misery loves company?

Nor did I shine in the accompanying histology course, through no fault of F.M. McFarland. There were troubles distinguishing stained cells through colorblind eyes. Which ones were violet, purple, lilac, blue, pink? Most memorable were the wonderfully arranged dental tissues in the embryology segment of the course -- clearly there had to be an omnipotent Maker.

Many undergraduate courses at Stanford then were scheduled either for Monday-Wednesday-Friday or for Tuesday-Thursday-Saturday. Anatomy occupied one third of our first year Saturday mornings, all of which in the second year in the city were scheduled for physical diagnosis, pathology, and pharmacology. Saturday morning instruction was the norm throughout all the clinical years.

J. Murray Luck did as well as anyone could with biochemistry, in lectures and laboratory exercises which perforce primarily dealt with analyses of blood and urine. He arranged for recent graduates Eaton MacKay and Douglas Drury to address the class on diabetes mellitus and renal failure, respectively. While never warmly in favor of a clinical exposure for students who have not yet learned the basic sciences, I must admit that the occurrence, if not the content, of those lectures remains in memory.

Medicine had just turned from its era of ascendant bacteriology to that of abnormal physiology. The department of physiology was not strong, and we were destined to learn most of its subject matter from Hanzlik and Dock in the city.

Neuroanatomy under Clara Stoltenberg and bacteriology under Edwin W. Schultz detained us on campus during autumn quarter of the second year. This was an easy breathing period, but a restless one, during which there were many individual trips to Lane Hospital for snooping in general or sitting awed in surgical amphitheater.

Introduction to Clinical Medicine

The great day could be postponed no longer and almost all of us who started medicine in the fall of 1928 migrated to San Francisco in January 1930. There were lectures, mannequins and a few patients in obstetrics and gynecology. There were lectures, the lancing of boils, and other minor surgical procedures with Emile Holman and Frederick Reichert. There was the exciting dog lab with Reichert and diener John Kratsch putting us through our turns as chief surgeon, assistants, and anesthetists during real "major" procedures of our very own. There was Harry Wyckoff's course in laboratory medicine, wherein we counted blood cells, measured hemoglobin by Sahli's method, detected protein and sugar and examined sediments of urine specimens from real patients. One recalls that in those days the terminal chapters of texts on physical diagnosis were devoted to such laboratory methods, while there was one book exclusively on the topic, by Todd and Sanford.

Major courses in pathology, pharmacology, therapeutics, public health, and tropical medicine started that winter and continued during early afternoon hours of the third year. None of this was called "introduction to clinical medicine" then, and the period was memorable especially for physical diagnosis.

Physical Diagnosis and the San Francisco County Hospital

Just as Arthur Bloomfield was "The Professor" at Lane, so was George DeForest Barnett "The Boss" at the County Hospital. It was he who was in charge of the physical diagnosis course. On its first day the sophomore class, just moved to San Francisco from the campus preclinical courses, sat in a surgical amphitheater. Dr. Barnett stalked in unannounced and unattended; he pulled forth a small volume from the kangaroo-pouch-like pocket in the front of his white smock, and read to us Voltaire's story of the powerful observational

abilities of Zadig. Finished, he left the room for his assistants to take over. What happened then is not memorable -- but Zadig remains. Some of his successors, myself included, also tried to read from Zadig; my own attempts were utter failures. He described the course in three pages of the *Journal of the Association of American Medical Colleges* (Appendix A).

Professor William Ophüls was not only the professor of pathology, but part-time dean as well, in a small office with one secretary. Perhaps because he was dean, Ophüls was one of the few to call a roll before his lectures. He did so in quick military fashion -- "Azevedo, Bancroft, Black, Boone, Boscoe, Brink, Clark, Cohn,.... Wong, Zombro" without pause; a missing response, "Here," led to a mark in his book; we never were entirely certain that the black mark correctly went to the absent one. Incidentally, all assignments during the entire four years were arranged by alphabet; we were, however, free to take any vacant seat in the lecture hall and rooms. At autopsies followed by "organ recitals" and at the bench, we finally learned gross and microscopic anatomy. Edward Butt, James B. McNaught, David A. Wood, and Alvin J. Cox, Jr., were helpful assistants who later became professors of pathology; Jean Oliver was there only for our first year.

Professor Paul John Hanzlik presided over pharmacology. The "Iron Duke" was strict but fair, a strong force in the executive committee, and a fine teacher. His staff included Maurice L. Tainter and rather later, Windsor C. Cutting. The diener was Joe Canseco (later Bing Moy), who set up the multiple animal preparations that really demonstrated such events as arterial pressure changes recorded on smoked kymograph drums under our startled eyes: this was where we learned physiology. One recalls the tall, straight, close-cropped (gray) Hanzlik bounding back and forth in the three ring circus of simultaneous demonstrations, literally pointing out drug effects while shouting, "You see, you see," to direct our attention appropriately.

There was a shelf with many bottles of drugs. These we had to learn to identify by color, consistency, odor and taste. Possessed of a wicked gag reflex, I had to learn to swallow capsules and tablets (or else!) for laboratory assignments. All

unexpected results in pharmacology were accounted for by "altered functional state" or by "seasonal variation," while "a protoplasmic poison" took care of almost all drug actions.

Professor Ernest Charles Dickson taught public health two hours weekly at 4 p.m. in a dingy room next to that in which William Lew mixed food for the rats of Thomas Addis. An occasional cockroach also attended the lectures, which sometimes were halted briefly for a sort of seventh-inning stretch. The major content was environmental health, and most of the class were tired, warm, bored and sleepy. Yet Dickson was a decent teacher and an impeccable scholar who discovered the rôle of *Coccidioides immitis* in causing San Joaquin Valley fever and whose laboratory became host to Harold Chope, Charles E. Smith, Rodney R. Beard, and Lowell A. Rantz; later successors in this area were Marshall J. Fiese and Demo Pappagianis.

The Third Year: Ward Clerkships

At long last we were deemed ready for ward clerkships, the most memorable and rewarding part of the third year. These occupied all of six mornings weekly, plus late afternoon and evening hours when we were not at lectures.

The class was divided into two sections, one at Lane and the other at San Francisco City and County Hospital (now San Francisco General), for 16 weeks each. Each section at both hospitals was subdivided into eight weeks each of a medical and a surgical subsection. Luckily, I was one of a dozen students who began on the slow-paced medicine at the County. The nominal chief of service was Harold P. Hill, an eminent internist in private practice; the real chief, however, was the beloved "boss," George DeForest Barnett, who had given up an association with Tom Williams in private practice in Palo Alto (later to become the Palo Alto Clinic) to commute by train daily thence in order to accept the truly full-time Stanford position.

Barnett always was available in his small open-door office-laboratory on ward G; this too served as a meeting place for house staff and loyal young practitioners of the voluntary faculty who vied for the privilege of teaching physical diagnosis. Six of us were assigned one patient each on the men's ward, the other six with the women. Interns and residents were generous with help.

At any rate, we could take several days with one patient to take a history, perform a physical examination, examine the blood and urine ourselves, ponder the findings, and write it all up (including negative findings too) according to an inexpensive pocket-sized guide. This went to the house officer for corrections and discussion, and finally we presented our cases to Doctor Barnett, either on regular rounds or in his office, to be followed by a bedside visit for confirmation or demonstration of findings. Our questions addressed to

Barnett usually were answered by that Socrates by asking another in return. Barnett was a handsome, tall man with thinning gray hair who not only was an outstanding clinician and teacher but also was a mathematician and a chemist who devised improvements in the methods for determining urea in blood and urine for Addis. Addis had given his urea ratio as a pure number, which Barnett demonstrated to be the number of deciliters of blood cleared of urea in an hour, but instead of "cleared," the word used was "freed." Homer Smith, pointing out the absence of any word "freeance", later thought that renal physiology might have forged ahead earlier had "cleared" and "clearance" been introduced at that time.

At both hospitals, we regularly told each other of exciting abnormalities discovered, examined each other's patients in addition to our own, and visited both wards for wider scope of experience. One patient satisfactorily concluded for the moment, another was assigned. Some students had a new patient almost daily, others weekly. At the regular daily rounds, any or all students were quizzed at each bed regardless of assignments; present were the half-dozen students, three or four interns, a resident or two, a voluntary faculty member if attending, and Doctor Barnett with a young instructor.

Such a leisurely and benevolent experience proved to be in some contrast to the very formal and fast-paced one encountered six months later at Lane Hospital (with those whom Barnett semi-humorously called "the wise men of Clay Street") on Arthur L. Bloomfield's medical service. Here a patient assigned as late as 6 p.m. or so might well be presented at next morning's rounds. Escorted by the chief resident, the professor entered the ward very promptly at 9 a.m. and went directly to the bedside, where he stood by the right side of the patient's head. Across from him stood the nurse, who facilitated his physical examination by deftly manipulating the prearranged bedclothes and who used a small towel to cover the genitalia and female breasts; during chest examinations she also deflected the patient's breath with a paper napkin. Incidentally, no pelvic examinations on either inpatients or outpatients ever were performed by males

without a nurse (or occasionally a female attendant) being present.

The nurse on rounds also carried a small, white enamel tray which contained flashlight, tongue blades, otophthalmoscope, sphygmomanometer, reflex hammer, tuning fork, pins, sticks with cotton-wisp tips, grip dynamometer, tape measure, and marking pencil; there even was a lemon coated with paraffin (as lemons had been shipped in earlier times) to illustrate what our predecessors had meant by the lemon-yellow skin tint of patients with pernicious anemia. Unlike the lemon, the instruments were there for use rather than for show: we six students watched the way in which a medical professor actually performed an examination. One of us, presenting the patient, stood across the bed from Bloomfield and next to the nurse, with intern at his left; residents and others of the group had accustomed places ranging around the foot of the bed.

At Lane, our write-ups also were reviewed by house officers, and corrected versions became a permanent part of the record. So did the results of our laboratory examinations, each report on vari-colored coded paper slips of about 4x5 inches being pasted by the intern into its place in the patient's file chronologically.

Leo Eloesser was chief surgeon at the County at that time. He was a most unusual man in many ways as well as a pioneer in the newly developing field of thoracic surgery, which then was primarily the surgical treatment of pulmonary tuberculosis (acquired by too many of the students, nurses, and staff), lung abscess, and empyema. "The Doctor" met the students (all of whom he called "Dockie") on ward C every Wednesday at about 7:30 a.m. and saw every patient (some 40 of them) on the ward; each student presented his patients. "The Doctor," like "The Boss," also was devoted to the Socratic method. Dealing with a well-prepared student, he usually passed quickly on to the next patient, but he often quizzed ill-prepared ones almost interminably. He hung his head in shame for the unprepared student but never orally chastised him. Never was a student faker exposed so neatly as he who assured Doctor Eloesser during rounds that a bedded patient's gait was normal,

whereupon the professor pulled down the bedclothes to reveal an above-knee amputation stump. The group moved on silently, a lesson learned by all and especially by a red-faced scamp. With no time out for lunch or other distractions, Eloesser and the students continued rounds on their feet until completion by 3 or 4 o'clock.

At the County, admissions were strictly divided alternately between Stanford and the University of California, although any patient previously admitted would be returned to the prior service. Appropriate lists were maintained in the admission department of the Mission Emergency Hospital, physically a part of the County. The emergency service, also shared with California, was a clinician's delight. Students were assigned to it for one week, night and day, during which they might see 20 patients with acute abdominal problems.

Students and Patients

We students were able to develop close, friendly and professional relationships with our assigned patients. This commenced as early as physical diagnosis exercises, when some veteran patients often cheerfully gave the game away by telling us which of their organs might be palpable, or where best to hear their cardiac murmurs, or even what the diagnosis was supposed to be. We were not introduced as Doctor So-and-So, but rarely, if ever, corrected patients who prematurely presented us with degrees in medicine.

A classmate, Anthony Boscoe, once had a patient who was seriously ill and the subject of a number of consultations. Following a critical one of these held one evening between the chiefs of medicine and of surgery, the decision was to proceed to immediate surgical operation. They so advised the patient, who at once inquired whether Doctor Boscoe approved. The procedure was postponed briefly until Boscoe could be found, appeared on the ward, and gave his blessing to the patient and the professors.

Another man on the Lane medical ward had cirrhosis with hypersplenism, then called Banti's syndrome; splenectomy was advised. Short of funds, he had to transfer to the County. His student, fearful of the quality of postoperative nursing care there, urged him to apply to relatives for enough money to permit surgery at Lane. He soon succeeded and phoned his student who had him sign out against medical advice and who drove him back to Lane for the operation. Death ensued a week later, following which the student briefly took to bed with a fever; he later remained a firm believer in psychogenic pyrexia as an entity.

The Fourth Year: Specialties and Outpatient Clinics, Midday Exercises

Then as now, the more acutely and severely ill were in the wards where they received some personal attention from full professors; those with milder, more chronic, and less organic ailments were in the outpatient areas, where our teachers were either voluntary or younger faculty members. The clinics, all at Lane, were a great let-down after the previous year's excitement. In addition, San Francisco had well-organized ambulance and hospital services for emergencies, in which our Clay Street facility did not share. The slow pace and easy hours seemed desirable features and the recorded notes could be pithy.

Memories of the surgical specialty clinics are remote and sparse. Countless Unna's boots were applied for patients with bad varicose veins. The G-U clinic was noteworthy for trough-urinals like those in a stadium, with numbers of men lined up to them for urethral installations of potassium permanganate solutions against their gonococci.

Medical clinic had its share of patients with headache, backache, arthritis and obesity. In depression years, house staff wrote orders for social service to provide additional funds, so that the obese could buy more expensive food containing fewer calories. Jake Lewis and Bill Dock always were willing to drop by on request to see an interesting patient or to settle questions on heart sounds or murmurs. We took turns at the special clinics for diabetics, for asthma, and for skin diseases. Charles Barnett was just beginning to separate the treatment of syphilis from dermatology, and Don Hines was demonstrating the special procedures of diagnosis and therapy, and lecturing on dietetics.

Cardiac clinic was well organized and frequented. There were many patients with rheumatic heart disease, a few with congenital disorders -- not once in many years did we see infective endocarditis appear in any of our own patients

despite the absence of today's so-called prophylaxis with antibiotics at visits to the dentist, although we recognized it all too easily in others referred to us. Uphill one block from the Fillmore street cars, this clinic served as an automatic measure of effort dyspnea or angina pectoris.

In addition to the outpatient work, there were required lectures in the surgical specialties, child welfare, legal and industrial medicine, psychiatry, and the history of medicine. There were 3-hour blocks of time for elective work, of which 80 hours were "required" in 1929-30, 200 in 1931-32 when the previously mandatory thesis requirement was dropped.

Perhaps the fondest memories pertain to the midday exercises. Sometimes at 11:30 a.m., sometimes at 1:30 p.m., and with some changes in days of the week, a typical line-up was: radiology conference, Monday; medicine set clinic, Tuesday; clinical pathological conference, Wednesday; pediatrics set clinic, Thursday; surgery clinic, Friday; and outpatient clinic, Saturday. The first three of these are remembered most vividly.

For radiology conference, Robert Newell weekly brought to Lane Hall a stack of films on patients currently in the hospital. These were shown to senior students, those juniors on assignments at Lane Hospital, medical and surgical house officers, young faculty, and especially Emile Holman and Arthur Bloomfield. Perhaps those two occasionally agreed to disagree, but often disagreements and discussions were hot and heavy. Bob Newell always had the final word; the exercise ceased when he retired.

For Tuesday's set clinic in medicine, Bloomfield selected a suitable patient on the wards Thursday or Friday, when the student who "had the case" was notified that he would give the presentation. The house staff's job was to keep the patient from leaving in the interim. The professor went through a list of important exemplary states of disease about every two years, and provided lists of references weekly. On the rare occasion (in his later years) when other obligations might prevent his weekend review of and preparations for the hour, he called upon an associate professor to preside -- this never

happened around 1932. A patient, with a nurse from the ward, arrived on guernsey or in wheelchair just before the appointed hour. A perspiring and palpitating junior student gave the presentation to about the same audience as just mentioned. Details of the history were filled in, where necessary, by adroit questions from Bloomfield (or, occasionally, from the audience); the patient, always coached in advance about the exercise, usually enjoyed his or her experience (or at least seemed to do so), and was excused to return to the ward prior to further discussion. The large blackboard had been filled by the student that morning with an outline or other relevant material given him by Bloomfield on Monday. Then the questions began, from Bloomfield to the student at first, to the audience later. In freshly donned newly cleaned white coat, hands clasped behind him, teetering gently on heels, he went to work and within the hour made complex topics simple. Case history, the findings, abnormal physiology, differential and specific diagnosis, and management of that particular patient were covered in order, with a bit about historical perspective and a few advanced tidbits for the older folks in attendance. How that man could teach!

The pathologists prepared the one page protocol, mimeographed and distributed to students and faculty on Monday, for Wednesday's clinical pathological conference. Ophüls and Jean Oliver were succeeded by James McNaught, David Wood, and Alvin Cox as leaders of the CPC. With few exceptions, Bloomfield was the weekly clinician. The format was very much like those of the Cabot cases; students could expect to be questioned from time to time.

Examinations and Honors: Electivity and the Curriculum

Final written examinations were the rule on campus. President Ray Lyman Wilbur adhered to the policy of examining undergraduates and letting them know just where they stood. As a student, he himself had had some indecision about attempting medicine, at least in part through lack of formal knowledge as to his class standing. In fact, a university bulletin, known to us as *The Bawl-Out*, printed every quarter, gave not only the student's name, major subject, address and phone number, but also listed the number of course units passed (e.g. 30) and his average grade (e.g. +60 for a straight A, +30 for a B average, etc.). Graduate students were not so listed, but each of us had a pretty shrewd idea of his own abilities and also of those of everyone of his classmates; we often wondered whether the faculty knew as much about us.

Major courses, preclinical and clinical, concluded during Stanford's "dead week" with brutal 4-hour examinations written in official blue books under the honor system. I recall only one man expelled, in the first years, with dishonor; cheating was very rare. Minor courses finished with similar 2-hour examinations. In the city, to the written examinations there were added practical tests. Pathological specimens and drugs had to be identified and discussed on the spot; Dock gave a brief written quiz weekly on an aspect of abnormal physiology; and above all each performance during ward rounds was rated. The evaluations of today's sort were never committed to paper, but surely each faculty member had his own evaluation of every student (and of course vice versa).

The curriculum 50 years ago was obviously old fashioned and rigid. Or was it? We learned the basic sciences, such as they were at the time, and were exposed to all facets of medicine in a reasonably logical order.

Others and I found time for hobbies in the laboratories. Addis was my first genial host: Douglas Drury and Eaton MacKay earlier had spent with him their "internship" year required for a Stanford M. D. degree, and many others were to follow as guests. Fred Fluhmann found me a corner for estrus studies in mice, a corner which I later filled with the genetically obese mice Charles Danforth had studied. Maurice Tainter and Paul John Hanzlik provided room in the pharmacology area, and Fred Reichert and Emile Holman had space in the dog surgical laboratories. Basic supplies were never a problem. Nights and weekends were free for the laboratories.

So was time during the work week. I never delivered a woman of her baby, but was able to obtain credit for observing the required ten deliveries by watching a few placentas come forth (and by dispensing a little tequila to the house staff). Lectures in the surgical specialties mostly went on without my presence. What we liked, we could repeat -- Roy Cohn and I attended two years of Bill Dock's presentations on clinical physiology after A.W. Hewlett's death.

Honors

The Alpha Omega Alpha chapter at Stanford was initiated in 1929, and was not active except for the annual automatic elections. Al Cox once addressed the group on his recent year in Germany, but no other functions of that era are recalled.

Students were much more involved with the Zadig Society, a group of a dozen or so third and fourth year men who met monthly in the upstairs Barkan room of Lane Library. Membership was by election conducted by members without faculty guidance, and included both "top" and other students. Each senior was expected to present a medical topic in review, and brought a faculty member as guest to open the discussion. There being relatively few facts to confuse or limit us, discussions were lively.

Norton Brown, M.D., Stanford 1929, was the student-founder of the group. He had wanted to name it the Barnett Club, and there exist copies of a handwritten, delightful reply from George Barnett declining the honor. Such societies, he said,

should take an illustrious name such as Hippocrates or Aesculapius, rather than the "ephemeral" Barnett. Further, his name would have "a chilling effect" on others of the faculty, in as much as he was "not sufficiently dead to inspire enthusiasm." Acceding to his wishes, Brown's group fell upon Zadig as an eminent substitute. Lane Library holds bound volumes of a number of presentations before the Zadig Society, which sadly withered away after World War II and before we left the city in 1959.

A completed thesis was required for graduation until July 1, 1931, when the number of "required" elective hours was raised from 80 to 200. One still had to prepare a report on an industry or town for public health; Lane Library may still hold one on the Armour packing plant in South San Francisco.

The House Staff

At Lane Hospital, the house staff structure had changed from rotating to straight services on July 1, 1931. In medicine at Lane, there were six interns, four assistant residents, and a chief. The interns each served twice for two months at a time on the men's medical ward, the same on the women's, two months in the general medical clinic, two months on pediatrics, and two months each on the neuropsychiatry ward and in its outpatient clinic.

The outpatient services provided a respite from the grueling ones on the wards. There, interns were on duty for two months at a stretch, with no scheduled times off. Those on the men's and women's wards fairly easily covered for each other for an occasional evening out during slack periods, or even for a Saturday or Sunday; an entire weekend off was virtually unknown. Smith and Jones, for example, signed out to each other only after reviewing their patients together in advance; there never was a Smith to Jones to Brown occurrence, with Brown ignorant of the ward population.

A ward intern could expect about ten admissions weekly, with a dozen patients or so in his charge at any one time. He was responsible for taking the history, performing a complete physical examination, and doing a blood count and urinalysis prior to rounds next morning. His examination was followed by that of the assistant resident, and was preceded by that of a junior student (clinical clerk) during the 9-month school year (when the students did the basic laboratory work).

There was an assistant resident on each of the two medical wards, a third in the medical outpatient area (moving between the general and specialty clinics), and one both assisting with outpatients and also attending to Doctor Bloomfield's private patients. At times, an assistant resident was assigned not only to Bloomfield's private patients but also to those of the regular medical faculty and voluntary faculty members. As might be expected, relationships varied enormously -- one

physician in effect abandoned his patients to the house officer, while some used him only to perform "scut work." The regular faculty cooperated fully, as did Bloomfield who invariably introduced the resident as his "associate." On balance, many residents viewed the experience as inferior to that of the standard academic service, but it was most useful in allowing them to see and evaluate a wide range of practices.

The ward assistant resident was responsible for the smooth running of his ward, overseeing his interns and students and standing between the latter on the one hand and the chief resident and professor on the other. He sometimes conducted very informal rounds, and was then and at other times an important teacher of his intern and group of four to five students.

The chief resident brought himself up-to-date on patients in both wards before meeting the professor at about 8:30 a.m. six days a week. He briefed the professor on new patients as well as the status of old ones, helped decide which patient would be seen in depth for the first hour with the students (most of the time, the particular student would have been alerted duly), and transmitted the professor's choice of patients for forthcoming staff rounds and set clinics.

Promptly at 9:00 a.m. the professor and the chief resident entered the ward; the chief stayed with an assistant, intern, students, and professor throughout the succeeding hour. Students were then excused, and young faculty arrived to join an entourage in seeing all of that ward's other patients (and at times to visit an interesting or critically ill patient elsewhere in the hospital).

Later each day, the chief resident served as the initial medical consultant to the other teaching services in Lane. He invariably presented each patient so seen to one of the faculty, and more often than not this was at the bedside. The chief resident also made his own relatively formal rounds (especially on Sunday) with younger house staff and students. Finally, he found time to busy himself with a clinical investigation, of which perhaps one a year was published.

The house staff on the wards tried to foresee and order in advance of rounds those tests and examinations they thought the professor would want. The range of such selections was very narrow then, but already some of the faculty were criticizing excesses for both aesthetic and financial reasons; perhaps luckily, in retrospect, the potential for harm also was limited.

Our "write-ups" concluded with a diagnostic "impression," a differential list of other possible or probable diagnoses, and suggestions for further studies and for therapy. However, decisions about treatment always came from the professor. He habitually dictated a brief note (a paragraph or so) on each new patient at the bedside for the intern then and there to write directly into the chart, and following that note he told the staff how to treat the patient. No serious revolt against that benevolent dictatorship is recalled. In much later years, when specialization began to flourish, Bloomfield would become angry whenever therapy suggested by a specialist consultant had commenced before he had had a chance to see that patient.

Treatment also was by direction in some of the specialty clinics, in which house staff members were but temporary visitors. For example, C.W. Barnett's protocols decided anti-syphilitic therapy in his "L" (for lues) clinic, W. Dock and J. K. Lewis were in charge of adult cardiac patients, and the allergists managed chronic programs in desensitization. On the other hand, house officers in the general medical clinic could do pretty much as they wished without supervision, although help was readily available (if asked for) from an assistant resident or faculty member.

House staff and faculty together regarded their patients as friends of the family whom they followed for months or years whenever possible. Addis never had to tell families or patients with chronic nephritis that death was nearing -- this was understood mutually. There were no malpractice suits. I cannot forget a contrary experience in 1947 of walking a ward with a former student, then house officer, in a large hospital elsewhere -- many of his beds were empty temporarily, their

erstwhile occupants undergoing mysterious studies at the hands of fellows unknown to my guide.

At San Francisco City and County Hospital, the medical, surgical, pediatric and gynecologic wards were divided between Stanford and the University of California, each school with its own wards, staffs, and students. Other wards were shared more or less equally by the schools; some services, such as obstetrics, were assigned to each school for half of the year. Stanford controlled some 500 beds, with about 6,000 patients per year. Its house staff there was limited to 21 rotating interns (a later dean characterized them as "vibrating") who were assigned to a score of set services either by lot or, at times, according to class standings. Trades of monthly rotation were allowed within reason, so that an intern could orient himself either to medicine or to surgery. Thus, one could take two or three months on men's medicine and the same on women's medicine, plus pediatrics, psychiatry, or Laguna Honda Home (for the aged ill), with brief stints on surgical wards, obstetrics, gynecology, and Mission Emergency Hospital. An opposite rotation stressing surgical areas could be arranged similarly. There were no assigned vacation periods or nights off for either interns or residents. The latter were assigned by specialties: medicine, surgery, obstetrics and gynecology, pediatrics and infectious diseases, tuberculosis, otorhinolaryngology, radiology, and pathology were available.

The senior house officer was responsible for the medical ward patients, for a few bedded ones who were employees of San Francisco, and for overseeing a small outpatient facility.

All laboratory work was done on admissions to the wards by students when available during the day; by interns and house officers at night. This consisted of blood counts, urinalyses, and at night also of blood sugars, CO₂, spinal fluid, etc. There were laboratory technicians only during the day; all blood specimens were drawn by students or house staff each morning.

As at Lane, house staff were the backbone of the daily working

and teaching rounds, radiology and clinicopathological conferences, set clinics, and weekly bedside grand rounds.

Financial Considerations

The 1928-29 annual announcement of the school states the "cost of living for medical students in San Francisco is about the same as at Stanford University, viz.: from \$150 to \$200 per quarter, exclusive of clothing and railway fares, and of tuition fees." This total of \$1,800 to \$2,400 for four years seems reasonably accurate in light of memorable dinners at La Favorite on Pacific Avenue near Stockton Street: a dish of hors d'oeuvres, soup, salad, chicken, house wine and dessert for 65¢, or "six bits" with steak instead of chicken.

The tuition fee was \$100 per quarter, or \$1200 for the four years. The one time application fee and diploma fee were \$5 each. A hospital fee of \$6 per year provided a degree of health insurance. Returnable annual laboratory deposits of \$30 to \$60 against "breakage, loss, or wear and tear of apparatus" were levied; students without microscopes deposited \$60 and paid \$15 rental each year. The two pages on scholarships, fellowships, and loan funds in the 1928-29 announcement contained eight short descriptive paragraphs.

Students were required to have the following equipment: stethoscope, percussion hammer, hemocytometer, hemometer, metal tape measure, eyebrow pencil, sphygmomanometer, otophthalmoscope, head mirror and band, nasal pharyngeal and laryngeal mirrors, nasal speculum, and a nest of three ear specula.

Student traffic between Clay and Potrero Streets was time-consuming enough for those in car pools (a Reo coupe with rumble seat helped), even slower for a nickel a ride in public street cars. There was never any difficulty in parking on the street within a block or two of either hospital, and no instance of vandalism or theft is recalled.

Interns at Lane Hospital received housing, meals, and a supply of white trousers and coats which the hospital

laundered. Residents in addition received \$25 to \$75 monthly. There were no fellows.

The annual report of the president of Stanford University for 1932 gives the cost to the university per patient day in Lane Hospital as \$6.03, as compared with \$4.19, the amount collected. There were 4,780 days of free treatment at Lane Hospital. The average cost per visit in the outpatient department was \$0.645, and the number of free visits there that year was 39,153.

The chief residents in medicine controlled an annual free-bed fund of perhaps \$500 for hospitalization of impecunious patients of special interest. There was a very helpful social service staff which was active particularly during those years of depressed economy.

A very early recollection is that of a radiology professor nearly reducing our sophomore class to tears enough to match his own -- he was leaving Stanford because the school would not agree with his desired financial arrangements.

Otherwise, those were days of fiscal innocence -- specifically, physician-faculty were not recompensed for procedures performed in their laboratories.

Addis' lab (described elsewhere) may have been the prototype for this philosophy. One presumes that he received from Stanford the usual "full-time" salary of that day, meant to be approximately equaled by fees from patients seen in consultation. The patients in turn were grist for his investigative mill, providing material for his classic studies in Bright's disease. As virtual subjects of clinical investigation, how could they be charged for special studies? The "special studies" were: urinalysis (Addis count done by Addis or one of us younger hangers on), hematocrit, blood urea, and occasionally a clearance (Addis urea ratio); serum protein concentrations became available only as special procedures upon particular request, with years to elapse before they became routine. Costs were absorbed by the laboratory, supported through small research grants. It probably never occurred to any of the faculty that we should receive a fee for

our services. We were learning, taking care of people, and above all enjoying ourselves. This is the way it was, and is not meant to give praise or to deprecate later developments.

The faculty were on "geographic full-time," which meant that its members had no offices elsewhere, and that a salary could be equaled by income from medical practice, usually via consulting fees. Consultations away from Clay Street were uncommon, if not downright rare. In the department of medicine, a combined examination and consulting room on the first floor of Stanford Hospital was reserved for the professor three afternoons a week (not always totally booked), while the remaining few in that department usually each had a half day there weekly. Each had perhaps three or four patients at any one time in Stanford Hospital, referred mostly from medical friends in the outlying vicinity. For these, the faculty member was entirely responsible. Students were not assigned to such patients, but one resident in rotation saw inpatients on a regular basis with Dr. Bloomfield.

No official accounting of fees was made, and the honor system worked very well. From time to time it became very apparent to an individual, as well as to his colleagues, that his interests were with practice rather than with the academic life, and he promptly resigned; he usually continued with some research and much teaching.

Sabbatical leaves were available but were never taken by anyone in the clinical field. One surgeon, in fact, said that he could not afford to go away on a vacation. That was a striking feature of the system: in addition to ensuring faculty experience in direct care of patients, it also assured their full-time presence at the facility.

As to faculty vacations, one month was utterly free, and in addition, all formal teaching exercises stopped during the long summer student vacation. Of course daily ward rounds and the care of hospitalized sick patients did not cease. A vivid recollection is that of the professor coming back from his vacation to see a patient we had happily recognized as one of the early thyrocardiac cases. Dock and Lewis and I eagerly waited for the professor to complete his physical examination;

when he had done so, he withdrew with us to the other corner of the room and whispered, "And how long has she had the cancer of the left breast?" which we all had overlooked completely. There is something to be said for coming back fresh as a daisy.

From the foregoing standpoints, the later introduction of "true full-time" was paradoxically retrogressive, with an increased number of faculty absent from teaching here.

Health insurance was not as overwhelmingly necessary then for young physicians as it is now, because of the widespread Hippocratic concept and practice of professional courtesy. Physicians either did their own billing or were in direct command of it; they reduced or entirely canceled their professional fees for services rendered not only to other physicians but also to their families, to medical students, nurses, nursing students and to the parents and close relatives of members of these groups. Moreover, they often saw to it that laboratory studies at the hospital were performed without charge; even hospital charges were reduced. Recipients were grateful but embarrassed, and returned the courtesies via countless lazy susans, silver trays, books, and bottles of every type of alcoholic beverage.

Special Lectures: Research and Other Medical Societies

Fifty years ago it took five days to reach San Francisco from New York, with that annoying transfer of trains and even of depots in Chicago. West of Texas there were medical schools at Stanford and at the University of California in San Francisco, at Loma Linda and the University of Southern California in Los Angeles, and one in Portland, Oregon. We were isolated but for the arrivals of medical journals and rare visitors.

Small wonder, then, that the periodic Lane lectures and Herzstein lectures every year or two were really big events, playing to full houses. Immediately preceding the initial Lane lecture of a given year, the guest speaker and his spouse were entertained at a small but very formal dinner at the home of a faculty member, usually the dean. Never more than a few minutes late, there filed into the front rows in capacious Lane Hall the invited speaker, dean, professor, et al., in black ties and dinner jackets, with their ladies resplendent in evening gowns. Introduction began only a bit later, after the buzzing of the audience subsided.

The California Academy of Medicine also held formal dinner meetings in San Francisco hotels during this period; their ladies were excluded and no women were members of the academy.

Otherwise, lectures by guests from afar were few in number; ten were listed in the *Annual Report of the President* for 1933. Sometimes these could be arranged by cooperation among the West Coast schools, but never for long in any organized fashion.

The research societies now meeting in Carmel annually were not formed until after World War II. Hewlett, Addis, Bloomfield and Dock all served as presidents of the American Society for Clinical Investigation; they also were members of

the Association of American Physicians, and sporadically attended the joint meetings of these Young and Old Turks in Atlantic City. Dock saw to it that some of us youngsters were nominated for membership.

Full-time faculty were not very active in the San Francisco Medical Society, California or American Medical Associations. On the other hand, both Ray Lyman Wilbur and his son Dwight became presidents of the American Medical Association.

Amenities and Social Life

There was a student lounge along Sacramento Street on the third floor of the medical school building. It contained about ten hard chairs and a long and unadorned wooden table at which many ate their brown-bagged lunches. The lounge was bounded on the east by a small lavatory, and on the west by an even smaller bookstore which was stocked by Stacey's Books, Inc., and which was run on a part-time basis by one of a succession of students. It also had pens, paper, stethoscopes and sundries for sale.

Not much beyond it to the east, across from the rear entrance to the top of Lane Hall, was the dean's office. An old story, possibly apocryphal, has it that Dean Ophüls once was conducting an important visitor about the school. Entering the students' lounge, they encountered a hot crap game. "The men are studying osteology," was reputedly the dean's remark as they quickly moved on. Chronic poker games were the rule there.

A single tennis court separated the nurses' home from the interns' home on the north of Clay Street across from Stanford Hospital; priority for play went to the house staff. In the basement of the nurses' home, accessible either by front door or via a tunnel under Clay Street from the hospitals, was a court for basketball, badminton or volleyball.

Not a few romances blossomed on these fields of sport, and at least one did so in the EKG lab's photographic dark room. Few of the house officers were married, both because of the economy and of Osler's interdiction. One chief resident of that period was about to join Ernest Goodpasture at Vanderbilt as a fellow, but the appointment was canceled when he admitted, upon direct inquiry, that he was contemplating marriage. It was absolutely unthinkable for a student nurse to be married.

An innocent weekend to Yosemite Valley one winter, chaperoned after a fashion by Drs. Parnie and Albert Snoke,

led to a great uproar, with house officers and student nurses alike called into the office of the hospital's physician superintendent for severe reprimands.

A medical school picnic near Searsville Lake began about this time, and briefly became an annual event. The campus spring sing, so often won by the nursing and medical schools, did not start until after World War II.

The Clinical Laboratories

For the two university hospitals, the clinical laboratories were of great importance. They were in the charge of Harry Wyckoff, associate professor of medicine. His staff was responsible for stocking the main students' routine clinical laboratory near men's medical ward, but usually he was to be found in the Stanford Hospital for private patients; this structure was up the Clay Street hill and adjacent to Lane Hospital, which housed primarily clinic patients.

Wyckoff was in charge of teaching laboratory methods to those of us second year students taking physical diagnosis, and was the expert to whom we went for help with blood counts and smears. His office was directly above the department of radiology and his clientele was largely that of patients with lymphoma and leukemia.

At the time in question his laboratories also were responsible for the blood chemical determinations and for the Wassermann tests.

The Ward Lab (and Others)

As sophomore students, we learned to do blood counts, urinalyses and stool examinations. The next year, as clinical clerks, we were responsible for performing these tests routinely upon our assigned ward patients; for the most part, the results were the only such ones in the Lane Hospital records. During vacation periods, the interns were similarly responsible. A spacious laboratory near the men's medical ward was available for these efforts; it consisted of sinks, lockers, running water, Bunsen burners, and reagents.

Interns and residents used a tiny lab between the men's and women's wards. There we also determined blood glucose when appropriate, and cultured sputum, urine and blood. Bloomfield introduced quantitative methods of culture, and after 50 years I still see the 830 colonies of green streptococci

per ml. of blood forming and growing in those Petri dishes of blood agar that first week. Thomas Stamey has noted Bloomfield's priority in quantitative urine cultures.

For more formal bacteriologic studies, Ernest Dickson had a larger laboratory, with technicians, two floors away from the wards, in the medical school building. This is where his pioneering work with Myrnie Gifford (M.D. Stanford 1920) showed San Joaquin Valley fever to be an infection with *Coccidioides immitis* and where Charles E. Smith and other successors worked out the immunology of that disorder. Still later, this was to become the site of Lowell A. Rantz's work on streptococci, antistreptolysin O, and rheumatic fever.

EKG Lab

The EKG lab was where my hat and coat were hung, and to which I retreated away from Addis' lab in 1939 after my mother died of uremia.

The Cambridge string galvanometer was imbedded in basement concrete after the fashion of that day, some say installed under the direction of Ray Lyman Wilbur himself. There was one spare string carrier, but no other instrument. The delicate quartz string rarely broke, but occasionally stuck to the walls of its carrier. William Dock and J.K. Lewis usually managed to free the string and to keep the shop open for its daily load of two or three records. These were mostly on clinic patients who could walk in and sit in an old chair against the wall; their forearms and left lower leg were immersed in jugs of salted water with 4" x 6" German silver electrodes attached to wires that ran up the wall, across the ceiling, and down to the galvanometer. Three limb leads were recorded on sensitized photographic paper, which usually was developed, fixed, squeegeed and dried after the patient had departed. Because of hilly Clay Street's rise, the EKG basement was contiguous with the corridor leading to the men's and women's wards above Webster Street; these were separated by a small ward laboratory and by two cubicles housing moribund or special patients. Wires connected the galvanometer to posts in a laboratory cupboard. Every now and then we would record from a ward patient whose bed had

to be wheeled to the hallway adjacent to the laboratory, thus blocking not only the laboratory but the linen closet and all inter-ward traffic as well. Rubberized cloths protected the bedding from towels soaked in freshly prepared salted water, which wrapped the electrodes to the patient's limbs; the student or house officer ran as a messenger to the lab to announce completed connections, and returned to the patient upon completion. Fortunately a mobile Hindle electrocardiograph became available in a few years, but more than a decade had to go by before portable machines arrived, first photographic and, finally, today's direct writer.

The two technicians performed BMR determinations in the EKG lab in the mornings, then EKG's later. Thus Dock and Lewis and their successors were not only perforce "cardiologists" but also experts in thyroid diseases. There were then no divisions, much less division chiefs. I cannot recall Bloomfield ever assigning his faculty to this or that task or post; rather we drifted in to whatever we wanted.

Available Laboratory Examinations

A perusal of the Cabot cases in the *New England Journal of Medicine* for 1932 shows how it was that Dr. Richard C. Cabot could discuss any week's case at once after seeing the protocol for the first time upon his arrival at the conference. The protocol was brief: a history, physical examination, blood count, urinalysis and little else (even some cases of cardiac infarction were discussed without electrocardiograms).

Every Lane Hospital patient had a "complete blood count" (erythrocyte and leukocyte counts, Sahli hemoglobin, and a differential smear), urinalysis, stool examination, and Wassermann reaction. We could do an icterus index or sedimentation rate, count platelets and reticulocytes, and measure bleeding and coagulation times, but there were no Wintrobe indices and the rare bone marrow biopsies were surgical procedures. Dr. Wyckoff reviewed questionable smears or obtained new ones when necessary.

Addis counts and quantitative rates of protein excretion were routine for patients with renal problems.

Stools were inspected briefly, tested with gum guaiac for blood, and examined under the microscope for ova or parasites.

The department of radiology offered chest (PA, lateral, stereo) examinations, skull films, bone surveys, myelograms, cholecystograms (usually oral), barium enemas, and studies of stomach and intestines. Everyone who had chest x-rays was fluoroscoped, and gastrointestinal examinations stressed fluoroscopy by the professors (who occasionally recorded "scout films"). Retrograde pyelograms were beginning to yield to intravenous urography.

The clinical laboratories offered the following chemical examinations: glucose, urea, nonprotein nitrogen, uric acid, cholesterol, calcium, inorganic phosphorus, icterus index, and

Van den Bergh (direct and indirect bilirubin). Serum protein determinations came just a bit later. These laboratories were closed completely on weekends.

The bacteriology lab of Professor Ernest C. Dickson, on the other hand, was always open. In addition to routinely quantitative cultures of blood and urine, his technicians also cultured sputum, spinal fluid and stools, and performed typing of pneumococci and serological tests for tularemia and for undulant, typhoid, and paratyphoid fevers. Gram and acid-fast stains, and guinea pig inoculations for suspected tuberculosis were standard procedures.

The laboratory of surgical pathology examined specimens of tissues from the operating rooms and clinics. The laboratory of obstetrics and gynecology conducted its own examinations of surgical specimens and of smears (for gonococci), and performed Aschheim-Zondek or Friedman pregnancy tests.

Basal metabolic rates, three lead electrocardiograms, and vital capacity determinations were available readily in the EKG lab. We measured antecubital venous pressure and circulation times (Decholin) ourselves. Arterial blood was not obtained, nor was cardiac output measured.

Not truly laboratory tests, a few specialized examinations may warrant mention here. We regularly used the ophthalmoscope, and in the eye clinic measured ocular tension. As a rule most of us rarely saw much beyond the tonsils; specialists performed laryngoscopy, bronchoscopy, caloric testing and audiometry. Proctoscopy was not rare on the medical wards, but esophagoscopy (like cystoscopy) was a procedure for surgeons. Gastrosocopy was embryonic; culdoscopy and laparoscopy were rare.

Research Laboratories

Although one classmate studied the range of joint motion under the department of anatomy, most of us ignored and were ignored by the researches in progress in all of the preclinical departments. Yet much investigation was pursued at the time, for example: skeletal anomalies unearthed by excavation of the Ponce Mound, rhythmic vascular uterine changes, reflexes in spinal and decerebrate cats, endothelial blockade and antibody formation, the nature of a number of viral agents (poliomyelitis, dog distemper, fox encephalitis, chicken sarcoma), the bacteriophage, localization of poliomyelitis virus in the central nervous system, respiration in the marine worm *Urechis caupo*, concentration of oxygen in tissues, muscle rigor, exercise, rat growth, development, and longevity, neurological mechanisms of feline emotional behavior, dinitrophenol for obesity, adaptation of human taste receptors, protein metabolism, heterogeneity of crystalline insulin, calorogenic action of arginine, pregnancy tests, "menstruation" in ocular endometrial transplants, and many other topics. J. Murray Luck initiated the *Annual Review of Biochemistry* in 1932.

Stanford then was well known and respected for its clinical teaching, but a fair amount of investigation went on in the clinical departments. In general and in retrospect, this was poorly quartered, staffed, or financially supported. Most of it took the form of clinical investigation, neither truly basic nor comprised of simple case reports. A few departments somehow managed to have enough space and monies to support laboratories not only for their own faculties but for guests as well.

Addis' lab of the department of medicine was one of these. It has been described in A. M. Harvey's *Science at the Bedside* as follows:

"Addis's Lab"

For many years, the main facility for research in the department of medicine at Stanford was referred to as "Addis's lab"-a high-ceilinged barn of a room that contained central stacks holding hoods in which Kjeldahl nitrogen determinations were performed; batteries of flasks for the urease method for urine and blood ureas; stills for water; a refrigerator room; a balance room; and a place for washing and drying laboratory beakers and other glassware. The rat laboratories were outside of this main room. Chinese dieners helped in all phases of laboratory work (The names of Lew, Lee Poo, and other dieners appeared from time to time as coauthors of papers with Addis). In one corner cubicle of the "lab," Leona Bayer and Horace Gray studied growth and used formal statistical methods with the aid of a calculating machine, which was advanced for the time (the 1930's).

In another corner cubicle was Addis, his twenty-inch slide rule in hand, and his record player turning out classical music. Addis's cubicle also contained a simply constructed table for physical examinations. This is where Addis saw his patients with Bright's disease, hypertension, or conditions that simulated them. For example, at one time Addis had perhaps the area's largest group of patients with myxedema, who had been sent to him because of their puffiness, pallor, usually hypertension, and maybe a trace of proteinuria, all of which led the physician to diagnose erroneously some type of Bright's disease. The patients were composed of two groups-his own private patients, and patients of the Stanford University clinic service. They all sat in the waiting room, where they mixed comfortably. If there ever was any question over who was there first, Addis would take the clinic patient before he would take the private one. His wife, who had been a nurse-dietician, worked out their low-salt and adjusted protein intakes.

A succession of colleagues and students worked in this laboratory, which was supported mainly by the

Rockefeller Fluid Research Fund. Perhaps the first were Douglas Drury and Eaton MacKay, Stanford graduate students who spent a year with Addis as an acceptable elective experience in lieu of Stanford's pre-1944 requirement for a year of internship prior to award of the M.D. degree. Later came William Dock, A. L. Bloomfield, B. O. Raulston, Charles Barnett, David Rytand, Roy Cohn, Albert Snoke, David Karnofsky, Windsor Cutting, Richard Cutter, Marcus Krupp, Joseph Davis, Edward Persike, John Thayer, Richard Lippman, Eloise Jameson, and Florence Walter.

Belding Scribner, a Stanford medical student who was interested in Bright's disease and blood chemistry, worked in the laboratory. Addis had one of the early electric pH meters, perhaps the only one in the area in those days, and, in 1945, when Scribner went to the San Francisco County Hospital to intern, Addis presented him with this pH machine, which launched Scribner on what proved to be an outstanding career in the study and treatment of renal diseases.

Apart from the mainstream of studies in the laboratory, guest workers examined such things as specific dynamic action; hypoproteinemia; salmonellosis and reversible uremia in the rat; plasmapheresis; pulmonary compensatory hypertrophy after pneumonectomy; concentric and eccentric cardiac hypertrophy; renal blood flow after subtotal nephrectomy; the role of the kidney in hypertension with coarctation of the aorta; the number and size of glomeruli in the kidneys of elephants, rats and mice; the effect of thyroid on tadpole maturation; and electrophoresis of serum proteins.

John Luetscher, who was at Johns Hopkins, moved to Stanford in 1949, shortly after Addis's retirement. Luetscher inherited Addis's laboratory and was in charge of clinical chemistry. He installed the first flame photometer at Stanford and worked with a series of fellows, beginning with Quentin Deming, demonstrating the presence of electrocortin, later called aldosterone, in the urine of nephrotic subjects.

In the EKG lab, W. Dock and J. K. Lewis were making original contributions to the valvular origin of the first and gallop heart sounds. To this end, Lewis manufactured incredibly thin and fragile collodion membranes, which were placed on Frank capsules, completed with a tiny fragment of mirror; its sound vibrations were magnified by means of a long light beam which was thrown upon moving sensitized paper together with an electrocardiographic lead as a timing device. A bit later, Albion Walter Hewlett's son William brought to this laboratory a box of galvanized iron, perhaps a foot high, one wide, and six feet long; it was filled with vacuum tubes and other electronic amplifying paraphernalia and would have been the first (or at least an early) electronic recorder of heart sounds had it worked well.

Professor P. J. Hanzlik and Maurice Tainter were gracious hosts in the pharmacology laboratory to a series of students and others. Some of their studies were on: Iodobismitol, dinitrophenol, diuretics, digitalis and the Gibbs artificial heart-pump, dental actions of fluoride, the sympathomimetics and the toxicity of propylene glycol.

In the gynecology laboratory, studies included those on transplantable tumors in rats, toxemia of pregnancy, and hormonal interrelationships.

The Halsted surgical laboratory was directed by professors Emile Holman and Frederick Reichert. Major topics included: the circulation accompanying arteriovenous fistulae and congenital heart diseases, the bronchial circulation, pulmonary arterial and lymphatic vessels, bronchial stenosis, lumbosacral nerve roots, cystic pulmonary disease, and intracranial hydrodynamics.

Also under study here and there were: thyroid and heart disease, anemia with diaphragmatic hernia, gastric anacidity and protein digestion, variability in counts of leukocytes, the intrinsic factor in pernicious anemia, ethyl alcohol's effects, and the rib scalloping (today erroneously termed notching) with coarctation of the aorta.

The foregoing selection is but an incomplete sampling of some of the clinical investigations performed here about 1932.

Therapeutics

Our surgical friends often jibed that internists could offer nothing but bed rest and ward rounds, with an occasional blood count. If one excludes the large proportion of our patients with nothing amiss but what we called psychoneurosis, they were pretty much on target. Paul Beeson has provided an excellent and detailed review of changes in therapy between 1927 and 1975.

Patients with early syphilis received long courses of neoarsphenamine and Iodobismitol, and occasionally received the hepatitis virus as well. Only quinine was available against malaria. Those with pulmonary tuberculosis went to sanatoria for prolonged rest in bed (too many nurses, students and staff became infected); some also underwent pneumothorax or pneumoperitoneum while extirpation of the affected organ was standard for unilateral renal or epididymal involvement, and Emile Holman was beginning to resect even actively diseased pericardia. There was vague mention of chaulmoogra oil for leprosy, of an antimony preparation for some other exotica. Emetine was available for amoebiasis, methenamine for urinary tract infections. Live maggots were applied to open, festering chronic osteomyelitis. Dakin's solution, alcohol, tincture of iodine, gentian violet, and mercurochrome were antiseptics for the skin. Silver nitrate solution prevented gonococcal ophthalmia neonatorum, and male urethrae were irrigated with KMnO_4 for gonorrhea. There were a few anthelmintics (with odd names) for intestinal parasites.

There were antitoxins to be used for diphtheria, meningococcal meningitis and scarlet fever. Pneumococcal antisera were used more for typing of organisms in sputa, less so for treatment.

The first sulfonamide, Prontosil (sulfanilamide), was not available until after my house staff days concluded in 1936, and of course there was no penicillin either for another decade.

Preventive agents included diphtheria toxoid, vaccines against smallpox, typhoid fever and rabies, and cod liver oil or viosterol for rickets. Tuberculin skin testing was fairly routine, but chest films were not.

Cardiac patients in failure had to make do with tablets of digitalis leaf (there was one man who grew his own foxglove and powdered the dried leaves for his use). Injectable forms were used chiefly by one urologist for patients undergoing prostatectomies, and purified forms were used only a bit later. Quinidine sulfate was the only agent at hand for ventricular tachycardia or for the equally rare attempt to convert auricular (sic) fibrillation to sinus rhythm. Intravenous injection periodically of an organic mercurial (Salyrgan) was the only effective method for diuresis. Ammonium chloride was of but poor and transient use when refractoriness to mercurial diuretics occurred. Oral agents of theobromine or theophylline were virtually never satisfactory diuretics. Phlebotomies of 500-700 cc were common, as were removals of thoracic and abdominal fluids via needles or trocars. Once in a while we were successful in removing edema fluid with Southey-Leech tubes; a set rests now in my desk, unused for over three decades but to show to students when the spirit moves.

Phenobarbital, chloral hydrate, and morphine were used freely for congestive heart failure. When Cheyne-Stokes breathing was present, caffeine sodium benzoate was injected together with morphine. Oxygen was administered only in Barach's tent; from time to time we analyzed the cool contents to ensure a 40 percent concentration of oxygen.

Patients with angina pectoris warded it off with nitroglycerin under the tongue or took it in treatment of the attack, and they habitually received phenobarbital, too. Myocardial infarction meant weeks or months in bed, the patient at first being fed by nurses and being without lavatory privileges. One medical student reported that his father was being kept in bed elsewhere for over a year because his sedimentation rate had not yet returned to normal. Morphine sulfate was the analgesic, and it was used freely in doses starting at 15

milligrams and going to 30 to 60 milligrams for severe pain; no harm was recognized. A physician in discussion of Cabot case 18302 (*New England Journal of Medicine*, Volume 207: 468-70, 1932) noted that 45 milligrams every three hours was "not much dosage" for a patient with a painful infarct.

Heroin was still legal, but was used chiefly with elixir of terpin hydrate against cough; morphine and codeine were the chief pain relievers. Aspirin also was used widely and just then it was becoming known that amidopyrine was the cause of previously mysterious agranulocytic angina. Cinchophen too was on its way out owing to the acute yellow atrophy it occasionally evoked.

Colchicine was used for gout, Lugol's solution or saturated solution of potassium iodide for hyperthyroidism, particularly in preparation for surgery. The antithyroid preparations were not yet available. Saturated solution of potassium iodide was used frequently as an expectorant and to "liquefy" tracheopulmonary secretions.

There was much discussion as to whether chlorosis was a specific disorder; anemic young women received Bland's pills or iron and ammonium citrate until the then new ferrous sulphate took their place for the hypochromic anemias. For pernicious anemia, one prescribed liver "cocktails" by mouth; orally taken liver extract No. 343 was gaining favor; and injectable Cohn's fraction G was just coming. Solution (Fowler's) of potassium arsenate was the "treatment" for leukemia and Hodgkin's disease. Polycythemia called for phlebotomies by needle, purpura and profound anemias for transfusions (which on repetition often caused febrile or hemolytic reactions inasmuch as only the four primary blood groups had been recognized).

Patients with indigestion, with or without peptic ulceration, were likely to receive one or more of the following: frequent small feedings of a "smooth diet," tincture of belladonna (30 ml) in elixir phenobarbital (qs ad 180), sodium bicarbonate, calcium carbonate and magnesium oxide. Constipation was supposedly either atonic or spastic; for it we

gave mineral oil, phenolphthalein, cascara sagrada, senna, Epsom's salts or other saline purgatives, or castor oil.

Viosterol, cod liver oil, citrus fruit juices and preparations of yeast were in vogue, but not yet the word "vitamin." The hormones consisted of dried thyroid gland, parathyroid extract, "regular" insulin, epinephrine, and solution of pituitary.

Selections had to be made between the parenteral solutions of 5 percent glucose either in water or in saline, and 0.9 percent sodium chloride in water. Moreover, these could be given either intravenously or as hypodermoclysis. Glucose as 50 percent in water also was available. The introduction of bicarbonate, lactate and potassium into solutions (e.g., Hartman's) was just commencing.

Special Modes of Therapy

Addis came to Stanford ostensibly to take charge of diabetic patients, but his interests soon turned to arterial hypertension and Bright's diseases; dietetics were important in all of these. Salt restriction was his weapon against hypertension, protein restriction to preserve the kidneys. A current study (Brenner B.M., Meyer T.W., Hostetter T.H., "Dietary Protein Intake and the Progressive Nature of Kidney Disease," *New England Journal of Medicine*, 307: 652-9, September 9, 1982) again calls attention to his work.

Bloomfield, interested in clinical gastroenterology, paid great attention to the diet. He and Don Hines gave an early elective course in that subject; dietitians brought specimen trays of actual meals for demonstration to students. Later we held "diet rounds" during patients' lunch hour as a required segment of the medical clerkship. Students were expected to approach a clinical diagnosis after their inspection of a patient's food.

The special diet kitchen across from Lane Hospital, on the northeast corner of Clay and Webster Streets, was responsible for every (quantitative) special diet for Stanford Hospitals, some 30,000 trays in 1932. Outpatients could be served there, instructions were provided, and loaves of low salt or soy bread, bran cakes, and melba toast purchased there. Student dietitians were educated. Finally, the second floor of the diet kitchen had a large room in which the faculty gathered for lunch and fellowship (see pages 10 and 11 in *The First Hundred Years* for a picture of this).

The physical therapy division (of the department of medicine) taught therapists and medical students and provided 4,000 to 10,000 therapeutic services annually. William H. Northway became chief there, and later was associate dean to L.R. Chandler; he also served as physician superintendent at Palo Alto Hospital and was physician to the Stanford basketball and football teams for years.

The Professor and His Job

Arthur L. Bloomfield ("The Professor" to everyone) ran the department of medicine, which early on included what later became departments of radiology, dermatology, physiotherapy, and neuropsychiatry (only a few years earlier pediatrics also was within medicine). Occasionally a student clinical clerk might be assigned on one day to a patient in each of pediatrics, neuropsychiatry, and medicine, but this was a rare triplet; doublets were common enough.

The professor was in active and personal charge. He did have two associates; Professor George DeForest Barnett ran the Stanford medical service at San Francisco City and County Hospital, and Professor Thomas Addis was virtually independent in his own laboratory. There were a few associate and assistant professors, and an instructor (not counting the two annually-changing chief residents).

Bloomfield held rounds on the men's ward each Monday and Thursday and on women's ward Tuesday and Saturday (punctually 9:00 a.m. to 10:00 a.m. primarily for students, 11:00 a.m. or so for housestaff). Staff (grand) rounds he conducted Friday 9:00 a.m. to 10:00 a.m. He joined Professor Robert R. Newell for an hourly radiology conference at noon on Monday, conducted medical set clinic on Tuesday, and joined Professor Dock or Cox for a clinical pathological conference every Wednesday. He conducted history meetings weekly to review patients just dismissed or deceased and to follow up other patients. He saw in consultation three or four private outpatients a week, and had about the same number in Stanford Hospital. He rarely left the premises in consultations. He sat on regular monthly meetings of clinical and executive committees. Every paper written by a full time or voluntary faculty member, to be submitted to a journal as coming from Stanford, was submitted first to Bloomfield for approval. The secretary in his office, Miss Ryan, was the sole secretary for the entire department of medicine. Each full

time faculty member regularly requested, in writing, a leave of absence for a vacation or for travel to a medical meeting.

The professorial office, reached by a small back stairs from Webster Street, was located on the second floor of the medical school building adjacent to the students' clinical laboratory and close to the men's medical ward. It consisted of two rooms, the first being a small reception area behind a door correctly marked "fire escape"; a small glass panel complied with safety regulations. Here sat Miss Ryan, and here were held departmental meetings. The professor's own room, or rather cubbyhole, lay behind a protective door separating the two areas. It had its own private door opening onto an examination area of the medical outpatient clinic.

Students were not supposed to attend Friday morning staff rounds, but a few were unobtrusively present behind the entire full-time faculty in medicine, surgeons, radiologists, and physicians (internists, mostly) of the San Francisco Bay Area, who so filled the men's medical ward that a weekly problem involved the temporary displacement to adjacent hallways of all but the four or five patients to be discussed. Younger faculty always attended daily student rounds to learn medicine and to learn how to teach it.

From the time of his arrival here, Bloomfield produced a mimeographed list of references for his weekly set clinic and had the appropriate journals and books set aside in Lane Library for students' use. In his last few years, he also prepared from time to time a syllabus succinctly reviewing one of the more important medical disorders.

He had come from Johns Hopkins after the influenza pandemic as a specialist in infectious diseases and continued that interest. His standing in that field was such that Stanford became one of the country's trial centers for penicillin when small amounts of that substance became available for civilian usage; a small ward under the direction of Jay Ward Smith (M.D., Stanford, 1944) was set aside for appropriate observations which led, among other things, to a series of important early publications for the treatment of infective endocarditis.

Salmonellosis came under Bloomfield's attention when it became endemic in a rat colony in which he was studying nutritional edema. A main and continuing interest of his was in peptic ulceration, especially with respect to the mechanism of pain and to the gastric secretions. Bloomfield personally performed continuous manual gastric aspiration on many patients after their stimulation with histamine, particularly in a group with "pedigreed" lack of secretion: *Gastric Anacidity* (with W. Scott Polland, M.D., Stanford, 1929) resulted.

Extending along the second floor above Webster Street, the men's ward of two rows of seven beds each was entirely open and without curtains but for one or two portable folding screens of white wood and cloth used for privacy during examinations. To the occupant of each bed there was assigned a small chair and a bedside table. At the southern end of the ward were the nurses desk and chart racks, beyond these a small and dark alcove with benches and chairs for the house staff.

Traffic through the ward was not permitted during teaching rounds, the calm of which sometimes was shattered briefly by the crash of garbage cans outside, but never by code calls, paging beepers or other modern cacophony. Even heavy smokers abstained for the duration. Coffee breaks were unknown until World War II; coffee was not sipped at the bedside and there were no conference rooms to which to depart for coffee or further discussions. The latter were often conducted at the bedside, but usually the group did withdraw a dozen or so paces and congealed together more closely for a *sotto voce* discussion of a miserable diagnosis or prognosis.

Rounds were all the more homogeneous in that all of its participants were Stanford folk. The nurses, who sprang to their feet at the advent of even a lowly intern, were graduates or students of the Stanford University School of Nursing across Clay Street. A great majority of the medical students had been undergraduates at Stanford, and they progressed into the ranks as interns and residents. There were no medical house officers from elsewhere until 1929-30, when

Bloomfield and his friend William McCann of Rochester, New York, arranged an exchange of interns involving Don Hines. Two years later a woman came from Yale as an assistant resident, and after a like period a man came to that post from Vanderbilt. More wholesale arrivals did not occur until 1946, when during the readjustments after World War II a number of assistant residents were appointed from afar, and when fellowships were established; among the first of these was Anthony S. Felsovanyi from Johns Hopkins, in cardiology with J.K. Lewis. There being no requirements for boards, most assistant residents stayed only a year; a few made it for two years and annually one of these was appointed as chief resident at Lane Hospital. There was somewhat more interchange among schools at the Stanford service at San Francisco City and County Hospital.

The women's ward consisted of one room, which was almost two semi-rooms, extending along Clay Street, beginning on the west a floor above Webster Street but deepening under the level of the street as the hill rose next to it. There was an additional three-bedded room down the hallway several steps; this one was right above a courtyard in which the morgue was situated. In a general way, we all preferred the men's ward rather than that for the women.

Thoroughly educated and highly intelligent, Bloomfield was remarkable for the erudite classical allusions which he appropriately brought to his teaching. He had many interests in music and general literature, especially Shakespeare, and fundamentally was a warm humanist with great personal concern for his associates and staff. He was a charming host and guest; in later years his house staff held an annual birthday party in his honor. On the other hand, he was a coldly intellectual and stylized exponent of the Hopkins tradition: on and off the wards he never addressed younger members of his academic staff by their first names, although he did this with young voluntary faculty whom he had taught or trained and who took night and weekend calls from his private patients for him. His rounds and other exercises began and ended to the minute, and he expected students, nurses, and house staff each to be in his or her accustomed place at the bedside. Consultations were in person (not by

exchange of written notes) and formal, never between Art and Joe, and he punctiliously preserved the respect of patients for those physicians who called for his aid. Toward and after his retirement he made his office in Lane Medical Library, where he returned to medical references and published two annotated volumes of *Bibliography of Internal Medicine* on his favorite topics.

Other Memorable Teachers

Gunther Nagel's *A Stanford Heritage* contains excellent chapters on Arthur Bloomfield and others of my teachers, while Harris Shumacker, Jr., has devoted an entire volume to Leo Eloesser. It was not difficult 50 years ago for a Stanford student to attach himself to a teacher engaged in clinical investigation, and three such clinicians remain especially memorable.

Thomas Addis was the first I approached, and his lab has been described above. A very warm and genial Scot, already recognized widely for his studies of the kidneys and Bright's disease, he had pioneered previously in hemophilia and urobilin. Tall and lean, with close-cropped gray hair and smoking a pipe, he seemed to be the prototypic absent-minded professor. With his wife and two daughters, he lived in Sausalito and rode the ferryboat twice daily. Refusing to drive an automobile, he came to work from the dock on the Fillmore Street cable cars; their conductors often allowed him credit, for he usually had no coins in pocket. In fact, Mrs. Addis regularly repaid such temporary debts as well as those small ones owed to students or house staff who used his lab; she also attended to the diets and financial arrangements of his patients, and of course was his occasional chauffeur when medical meetings or rare consultations took him away from Clay Street.

Also, it was she who provided the cookies for the daily afternoon tea, prepared by the Chinese diners and served in sparkingly clean beakers which at other times contained that fluid so important in the lab's studies. Bloomfield and Dock attended with Addis almost every day, associates now and then; a student and house officer or two sat mostly silent and wide-eyed, drinking in not only the Chinese tea but also the far-ranging conversations of these virtuosi; diners (who held conferences with Addis in order to plan experiments) were there too, a few paces away from the central tea and cookie desk. In earliest years, the mainstay of talk was medicine, the

sciences, and the arts; later on, as the world began to tremble, economics and politics increasingly occupied the group.

Addis was so softhearted as to dread the final hospital days of his chronically ill patients, inevitably friends by then. Offering occasional visits to cheer them and their relatives, he allowed young associates to make most of the medical decisions, within the narrow range of choices then available. He pretended to be ignorant as to appropriate procedures to be followed in the hospital, so that his associates would feel more useful. At the end, after free use of paraldehyde, an autopsy was performed on virtually every one of his deceased patients.

All of his patients were available for students and house staff, some of whom attended his regular clinic hours or his small elective and informal classes to which he brought a patient or two for practical exercises. Also soft with students, he gave his time and serious consideration even to the most stupid questions. He attended Bloomfield's staff rounds weekly and commented appropriately, but gave no formal lecture courses for students although he could not avoid entirely an occasional lecture to physicians. Those who referred patients usually were willing and even happy for Addis to accept them as transfers; he often managed to send a hand-written note as initial report, or telephoned his views and thanks. Much of his clinical effort was directed toward devising and improving simple and inexpensive methods for the examination of blood and urine appropriate to Bright's disease, methods which he fondly expected the doctor to perform personally in his own office. Finally, he managed to avoid committees and other forms of school administration like the plague.

William Dock was the second faculty member to accept me as a bit of a colleague. Many students regarded him as the most brilliant of our teachers, with Robert Newell, Arthur Bloomfield, George Barnett and Thomas Addis as close competitors. He had come to Stanford as a medical resident during Hewlett's last year and became an associate professor of medicine three years later, in 1928. His chief lecture course was a continuation of Hewlett's, in pathological physiology, and he made regular attending rounds and was a chief contributor at all medical department conferences, staff

rounds, and teaching exercises. He was voluble at all such times as well as at tea with Addis, and for many years performed much of his experimental work with the rat colony adjacent to Addis' lab. Addis was fond of music; Bloomfield of music and books; Dock of these, flowers, hiking in Marin and elsewhere, and mountains; all of them had great knowledge of history, both medical and general.

Dock's investigations covered a wide area of clinical medicine, abnormal physiology, and pathology; his firm views provoked much discussion and, at times, argument; above all they invited thought and this may have been the clue to his power as a teacher as he made us fledglings stretch our minds to the utmost. His wit was rapid and incisive, and it was he who later introduced Sutton's law into medicine.

One of Dock's main interests during my student days lay in the valvular origins of the cardiac gallops and first heart sound. These he studied in the EKG lab with John Kent Lewis, a former student and house officer of Hewlett and my third faculty hero in addition to Bloomfield. Lewis was, in contrast, a quiet and gentle man with great clinical acumen and interest in physical examination, especially of the heart; he was at his best on rounds or in discussions with small groups or lone students. He and Dock always seemed to be available in the EKG lab for instant consultations, and many times broke off their studies to walk out to the ward or clinic to help with unusual physical findings or therapeutic advice. While Dock went on to become a professor of pathology here and elsewhere, Lewis stayed at Stanford and succeeded George Barnett as chief of medicine at the County.

Lane Medical Library

Housed in an imposing 1912 structure of three and one-half stories just to the south across Sacramento Street and Webster, Lane Medical Library was at the least excellent and at the most was reputedly the best or largest of its kind west of the Mississippi. The medical librarian was the dean's sister, Miss Louise Ophüls, militarily erect, but kindly and helpful; there were four assistants.

Not harassed by vandalism or theft, the main stacks were open to all and browsing by students was welcomed. The library held 76,041 volumes, received some 600 periodicals annually, and in 1931-2 made 17,752 circulation transactions. A number of duplicates facilitated loans to outlying institutions and physicians. The University of California in San Francisco and the surgeon general's office in Washington, D. C., were cooperative. Except for items on temporary reserve for classes and set clinics, books and journals could be signed out for two weeks.

The shelved walls of the main reading room contained bound volumes of periodicals of the past decade or so. Decorated by three allegorical paintings by Matthews, the spacious room contained large, heavy oaken tables and chairs which were moved to the campus in 1959 and which remain in use today. One of these tables held the main North American current journals, another the foreign periodicals. The *Quarterly Cumulative Index* was at hand and the stacks began nearby behind the librarian's desk. Stairs and a tiny elevator went from the basement and lavatories below to the Barkan room ("Adolph Barkan Library of Ophthalmology and the Allied Sciences") on the second floor and to the section on the history of medicine on the third. This last area contained priceless volumes and was the only region of the library under lock and key. This was the realm of the professor in his retirement.

The library had been endowed under the will of Mrs. Levi Cooper Lane, and one of its most important early acquisitions

was the purchase from the New York Academy of Medicine of a duplicate collection consisting largely of books originally owned by the New York Hospital. Encouraged by Dr. A. Barkan, and with his further financial aid, the library had purchased the complete historical collection of Professor E. Seidel in Meissen and contained 4,500-5,000 volumes and documents from ancient and medieval authors and in the Turkish, Persian, and Arabic languages.

In 1928-9, a life membership of \$100 or a yearly fee of \$5 purchased full use of the library including the withdrawal of books for those not of the Stanford family. Consultation and use of books in the library were free to all comers. By the next year, the *Bulletin* complained of the "ever-increasing price of medical journals and books." The library raised its individual membership fee to \$10, commenced an institutional membership of \$20 annually, and following a circular letter, began to receive donations of about \$1,000 yearly from friends of the library.

Selected Items from 1932 Publications of Organized Medicine

The San Francisco Medical Society held monthly general or section meetings in its mansion at 2180 Washington Street, which also housed its fine medical library and Stanford student members of a medical fraternity. Topics under discussion included use of selective pneumothorax and heliotherapy for tuberculosis, hyperpyrexia induced by diathermy for syphilis, pruritus ani and a review of rectal surgery. Weekly reports on communicable and other important diseases were published, as was a list of certified dairies, and the San Francisco department of public health reported formally on plumbing and sanitation. The society saw no objection to plans for medical and hospital care for employees of the Illinois-Pacific Coast Co., and agreed to hold further "discussion of standards for health insurance which would be considered reasonable by the medical profession." On the other hand, the Veterans' Hospital program was denounced, "with 300,000 beds vacant in 2,097 hospitals approved by the ablest hospital authorities in the country." Direct wire and telephone services were becoming available to physicians. Activities of the visiting nurses association and of the Community Chest were mentioned. It was announced that W. McK. Marriott would give a series of lectures for a month at the University of California Hospital, and that P. A. Shaffer was to present the Herzstein lecture. The heart committee of the San Francisco County Medical Society held its third annual meeting, prior to its later liaisons with the Tuberculosis Association and finally the American Heart Association.

Of our full-time faculty, Bloomfield was a director while Reichert and Faber served on committees of the society. Voluntary faculty members played more active roles, with Alderson, Chandler, Christierson, Eloesser, M. Gibbons, Gilman, Lyman, Pierson, Read, Rixford, Schaller, Schaupp and Seitz as some-time directors, section chairmen, or heads of committees.

California and Western Medicine listed Bloomfield and Ophüls, M. Gibbons, Rixford and Schaupp as councillors or committee members of the California Medical Association. It held reports on the treatment of acute coronary thrombosis, obesity, constipation, and syphilis; on the history of embryology (A. W. Meyer); cases of typhoid fever from contaminated shellfish; the quarantine of mussels and clams; activities of component county societies; posthumous letters from a medical missionary (dead of typhus fever) on medicine in Persia; Rixford was to give a Lane popular lecture. The "Final Report of the Committee on the Costs of Medical Care" under Ray Lyman Wilbur was presented complete with majority and minority reports, and received initially much adverse criticism both in California and across the country.

Wilbur was chairman of the American Medical Association's council on medical education and hospitals, while Hanzlik served on a subcommittee on scientific exhibits. No others of the faculty were involved at all prominently on the national scene of organized medicine.

The *Journal of the American Medical Association* was well organized and lively under Morris Fishbein's editorship. Its editorials were addressed more to scientific-medical topics than to economic, social, or political ones. Regular articles discussed: liver extract injections for pernicious anemia; iron orally for chlorosis; oxygen administration; streptococcal involvement in rheumatic fever; potassium salts for ventricular ectopy (J. J. Sampson); ovarian hormones for hemophilia; "habitual hyperthermia" as an entity; regional ileitis (Crohn et al.); the mystery of agranulocytosis. Patients with Hodgkin's disease were expected to live for two and one-half years without treatment, which consisted of irradiation delivered at 200 peak kilovolts. Those with "acute coronary thrombosis" were kept completely in bed (S. A. Levine) for 5-6 weeks, fed by nurses and inflicted with trying to use bedpans; they received morphine sulphate initially for pain, 15 mg every 15-30 minutes up to 60 mg over one to two hours; fruit juices containing vitamin C were recommended (Kilgore) to hasten healing. And in another respect there seems to have been no change over a half-century: J. C. Geiger, health officer of San Francisco, briefly noted the deaths of two

policemen and a businessman while drinking whiskey in the latter's office -- cyanide was recovered from dregs.

Regular features in the *Journal of the American Medical Association* included special articles (e.g., on diet, vitamins, fundamentals of the 3-lead electrocardiogram), reports of councils (physical therapy, pharmacy and chemistry), new and nonofficial remedies, book notices, abstracts of current medical literature (282 journals available for loan), proceedings of meetings of certain medical societies such as the Association of American Physicians, and a bureau of investigation which castigated quacks and misleading advertisements relentlessly.

The American Medical Association's *Annual Report on Medical Schools and Internships* from R. L. Wilbur's council, indicated that Stanford University hospitals had 12 interns, 171 student nurses, and 41 R.N.'s for nursing a daily average of 164 patients (7,050 admitted for the year) in 31 medical, 40 surgical, 38 pediatric and 204 other beds plus 27 bassinets.

Move to the Stanford Campus

A quarter-century later than my first residency year, the school moved to the Stanford campus in 1959. The action was hotly debated and we were damned roundly at one and the same time by San Francisco voluntary faculty we "were abandoning" and by Palo Alto physicians fearful of our competitive advent.

The move was some three decades in the making. Plans had been made in 1927 by Stanford, a medical school committee, and a firm of architects for a new facility in San Francisco; construction costs were to have been \$3,750,000. Enthusiasm was in great supply but money was not. An eastern donor offered \$2,500,000 under the condition that Stanford raise \$1,750,000 by February 1932, but the great depression ruled otherwise.

After another survey of the school, the Stanford board of trustees in 1946 approved plans for a new medical school building in San Francisco. Again there was the problem of funds, and the project was halted after the sudden death of President Donald Tresidder in 1948.

In 1951, the trustees reaffirmed their intent to improve the school in San Francisco on the basis of the 1946 report. A drive for funds was started, but in early 1952 the university administration called for yet another review which led to the ultimate decision on July 16, 1953, to establish a new medical school on the Stanford campus. Groundbreaking took place ceremoniously on September 11, 1956, and construction began nine months later. In 1958, only a few months before the dedication of the new school on September 18, 1959, old Lane Hospital was condemned for structural reasons by the California State Bureau of Hospitals for further care of bed patients.

The late Dean Loren R. Chandler, whose writings provided much of the data for the foregoing paragraphs, also wrote as

follows: "There has been much talk of moving the medical school but unfortunately this school cannot be moved. The school on Clay Street has lived a useful and worthy life. The old school as it has been known will close this summer. A new school, new in location, philosophy, objectives, curricula, and with many new faces on the faculty will be born in September, 1959, on the Stanford campus. The king is dead. Long live the king!"

Let us now examine some of the late king's anatomy as of 1957-8. There were 3,943 applicants that year of whom 62 were admitted (36 from California) and requested to pay \$1,005 annual tuition. Of the 234 medical students in the four-year program, 12 were women. In addition, registered students included 95 nurses, 22 technical students, 46 arts and sciences majors, and 29 enrolled candidates for advanced degrees (one physiology and three microbiology masters; one anatomy, one pharmacology, nine physical therapy and 14 microbiology doctorates). There were 43 interns and 131 residents. Lane Hospital had 351 licensed beds with 12,685 admissions; there was a 70 percent autopsy rate. There were seven straight medical interns, seven surgical, and one pediatric intern; their monthly stipend was \$75. The Tables (Appendix B) may provide guides to activities in each clinical division or department.

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Appendix A

The Introductory Course in Clinical Medicine*

GEORGE D. BARNETT

Professor of Medicine
Stanford University School of Medicine
San Francisco, California

The principal content of a beginning course in clinical medicine must be physical diagnosis. Whether we shall include more than that, and how much more, are matters to be determined by the special teaching problems of the school. If we have any special problem at Stanford it derives from the fact that we place our third year students in the wards as clinical clerks. Furthermore, as we are a so-called split school, the students reach us in the second trimester of their second year perfectly green and innocent of any clinical knowledge. In most schools, through association with upper classmen and through the atmosphere of hospital and clinic which pervades his life, the student by this time has acquired a considerable clinical vocabulary and a fair knowledge of the things doctors think about and do. Our students have not had the benefit of this extra-curricular preparation, and it is our problem to transform these blank specimens in six months into men capable of doing the things clinical clerks on the wards are expected to do. Manifestly, this cannot be done in the time at our disposal; but in the attempt to bridge the gap as well as possible it has seemed advisable to include in the second year course somewhat more than physical diagnosis.

The course in introduction to medicine is given at the San Francisco Hospital by our visiting staff in medicine. The time allowed in the curriculum is two periods of two hours each per week, a total of 84 hours. The general plan of the course is that we use the first half hour of each two hour session for classroom work with the whole class, and the remaining hour and a half for practical work at the bedside. In this practical work, the class is divided into two equal sections. One of these is further divided into groups of not more than six students, to whom are given demonstrations of physical signs and methods on selected patients. The other half of the class is assigned individually to single patients on whom they work alone and largely unsupervised. From session to session, the two halves of the class alternate between these two types of practical exercise throughout the course.

In the group work, we use the first four or five sessions for instruction in the normal in physical diagnosis. In this we do little more than instruct the student in the techniques of physical diagnosis and demonstrate the principal

*Read at the Forty-eighth Annual Meeting of the Association of American Medical Colleges, held in San Francisco, October 26-27, 1937.

normal findings and differences. From our experience of former years, we are convinced that a more elaborate and longer course on the normal is largely time wasted. When we have completed the work on the normal, the groups continue with demonstrations of physical signs and methods. There are five groups to be provided for at each session. Of these, two groups are shown whatever is of most value for demonstration in the wards, and a third group goes to the tuberculosis division, where every sort of chest abnormality is available. The remaining two groups are assigned special subjects such as blood pressure, neurological examination, physical examination of children, ophthalmoscopy, etc., and are shown the methods in use in these fields. The ten groups of the class rotate one after another through each of these special subjects. In general, the discussion in the groups is, at first, concerned only with physical findings. Later on, other aspects of the cases are included, and at the end of the course the group sessions differ little from the ward rounds of the third year.

We have been particularly interested in the other type of practical exercise: the independent work on individual patients. We begin this in the second week, and continue it throughout the course. It places a considerable share of the responsibility for his development squarely where it belongs—on the student himself, and he learns from it much more than physical diagnosis. He must begin, of course, with things that he can do. For the first few weeks, while he is receiving instruction in the methods of physical diagnosis, his work is confined to the examination of the head and neck, body surface and any other gross abnormalities he may find. This he can do, following the outline for physical examination, and as he acquires the techniques of percussion and auscultation, he can proceed to include the remainder of the physical examination.

Each student leaves with us each time a report of his findings on his patient. Before he returns to the ward, these are read and criticized both as to content and form, so that he may learn to write up a neat and complete report, such as will be required of him in his clinical clerkship. We ask him to spend the first few minutes with his patient in discussing the man's symptoms, and to begin his report with a brief statement of the major complaints. This is the only proper approach to the patient, and at the same time it gives the student a first hand introduction to the symptomatology of disease. He then proceeds to the examination of the patient, doing as much as he can. An instructor is available in the ward if he should need help; otherwise, he is unsupervised. When he has finished his report he may consult the hospital record for any information he wishes to have about his patient.

In the second quarter of the course, there is a small amount of instruction in history taking. On a certain day, instead of making a physical examination, he takes a history, following the outline. Unfortunately, he does not have time to complete his record by continuing with the physical examination of the same patient. His history is criticized with especial care, after which he takes a second history, and this is again red penciled in detail. This amount of history taking is inadequate preparation for his third year work, but it is all we have found time to do.

In the classroom exercise, which occupies the first half-hour of each two hour session, we use the first three or four periods in explaining the terms used in the outline which he is already making use of in the ward. By that time, the work in the normal groups has reached a point where a discussion of the fundamental pictures in physical diagnosis can be taken up: signs of consolidation, pleural fluid, pneumothorax, etc., and the rationale of the development of physical signs in the common heart lesions. This occupies another four or five sessions. During the remainder of the course, the subject is developed by means of the case system, using summaries of clinical data taken from our ward files. The student receives one of these at each session, and it is taken up at the next period. The discussion takes the form of a quiz or conversation, in which most of the class participates each time.

The use of the case system early in the teaching of physical diagnosis is doubtless open to criticism. When we give the student all the data on a case, we are presenting him with a problem for which he is not prepared. In his effort to make a diagnosis, he will slight the elements on which it is based. He will get clinical indigestion, so to speak, from which he may never recover. It is quite true that his main interest is apt to be in making the so-called correct diagnosis of the disease picture rather than in the study of physical signs and their significance. But, we believe that his eager interest in the whole disease picture at that stage of his development is a powerful pedagogic force; and on the principle that it is easier to learn two things than one, he should learn his physical diagnosis from case records better than from lectures and textbook reading. By a proper selection of cases and suitable guidance of the discussion in the classroom, the subject may be presented with whatever balance of emphasis we wish. Keeping the discussion rather strictly to physical diagnosis early in the course, we include more and more of the larger aspects of the cases as the year progresses.

There is, of course, nothing new or original in all this. It represents merely the particular juggling of the techniques of education we have used in attempting to prepare the student in a short time for his ward work of the third year. Dr. Reid, in his valuable little book on teaching methods in medicine, reminds us that most medical teachers are wholly untrained in pedagogy. The particular grouping of fundamental techniques which we make are at best amateur efforts. As laymen in pedagogy, it is probable that most of us will subscribe to the heretical doctrine that there is no magic in any method. Superior physicians have been produced by very many methods, and by no method at all. The greatest factor in successful teaching in the medical school is the work of the committee on admissions who select our material. Furthermore, whenever we judge our methods by their apparent success, it is well to recall that there is no real measure of success. The superiority of one method over another would have to be demonstrated by producing better doctors from the same material. Such a proof is manifestly impossible.

Appendix B

Some Numbers/Facts

This section presents in tabular form certain comparative or contrasting statistics in order to provide a more objective view of Stanford University School of Medicine, using 1932-33 and 1981-82. In addition, figures for 1957-58 give data for our penultimate year in San Francisco, while those for 1958-60 show something of our first steps on the Stanford University campus. A careful reader will find discrepancies, more or less minor, in some of the data; these are owing to the multiplicity of sources, overlapping intervals of time, changing nomenclature, and the amazing difficulties in finding consistent and authoritative information.

Table I provides overviews of administration, Lane Medical Library, student body and alumni, ancillary services, and certain diagnostic and therapeutic services.

Table II shows the sizes of the faculty, arranged by rank and present departmental arrangements. Table III presents data on the house staff and fellows of the clinical departments and divisions, while Table IV gives more detailed lists of current fellowship assignments.

Table V lists outpatient visits from the perspective of 1931-32, whereas Table VI does so from the perspective of 1981-82. Table VII shows traffic in hospital beds for similar years. Table VIII concludes consideration of a half-century ago by listing mortality rates in our country then and now.

For the 1958-60 period, Tables IX and X may be compared with Tables II and III. Finally, Table XI provides miscellaneous information from the JAMA 168: 521-692 (Oct. 4), and 1459-1547 (Nov. 15), 1958; these data represent our penultimate year in San Francisco.

Table I.
Overview of Administration and Miscellaneous Functions,
circa 1932 and 1982

	1931-2	1981-2
Vice President for Medical Affairs	0	1
Dean (and Associate Vice President 1982)	1	1
Associate Deans	0	8
Endowed Professorships	0	22
Applicants to School of Medicine	ca. 100	5,814
Candidates for M.D. degree, all classes	238	387
Candidates for M.D. degree, excluding interns	195	387
M.D. degrees awarded	43	81
Ph.D. degrees awarded	0	24
A.M. and M.S. degrees awarded	0	33
B.S. degrees awarded	0	14
Lane Medical Library		
Volumes in Library	76,041	301,178
Periodicals received annually	600	2,947
Circulation transactions	17,752	87,445
Photocopies	0	1,500,000
Expenditures,		
books	ca. \$2,024	\$ 37,004
journals	ca. \$6,072	\$300,522
binding	\$1,856	\$ 21,933
total (books, journals)	\$9,952	\$359,459
Medical Alumni		
Stanford graduates	433	3,014
Associate members	0	1,599

(continued next page)

Table I. (continued)

Diagnostic and Therapeutic Services			
	1931-2		1981-2
	Lane Hospital	Stanford Hospital	Stanford Medical Center
Radiology, diagnostic case visits	4,517	2,524	99,640
Diagnostic examinations			113,294
"Total units service"	19,269	14,457	
Radiotherapy treatments	2,628	1,884	26,773
Nuclear Medicine, patients	0	0	3,543
Physical Therapy, treatments	3,690	7,505	142,555
Emergency room visits	0	0	26,302
Basal metabolism tests	613	156	0
Electrocardiograms	213	347	37,283
Surgical operations	1,241	1,519	13,228
Operating rooms		8	16
Surgical pathology specimens		2,514	22,527
Deliveries, total		653	2,858
(Lane-Stanford 357, home 68, San Francisco County Hospital 228)			
Note: Data of 1931-2 exclude SFH except for deliveries; those of 1981-2 exclude Veterans Administration Hospital and other affiliates)			
Medical Center Auxiliary			
Active Volunteers		0	336
Total Membership		0	575
Annual voluntary hours		0	59,000
Blood Bank			
Units collected		0	13,000

Table II. Faculty in 1932 and 1982

	1932					1982															
	Fulltime		Voluntary Clinical			Fulltime	Clinical	Voluntary Clinical													
	Professor	Associate	Assistant	Instructor	Professor			Associate	Instructor												
Anesthesia Biochemistry Cardiovascular Surgery Dermatology Family, Community & Preventive Medicine Genetics Gynecology/Obstetrics Medical Microbiology Medicine Neurobiology Neurology Pathology Pediatrics Pharmacology Physical Therapy Physiology Psychiatry Radiology Structural Biology (Anatomy) Surgery	1	1			8	2															
	1		1		1																
	1																				
	2	1	1		5	1															
	5	3	1	4	7	7	5	19													
	1																				
	1																				
	1																				
	2	2	2																		
	4	2																			
	3		3																		
	TOTALS	22	8	7	12	32	27	23	44	68	141	97	103	15	15	26	101	298	509	287	

Table III.
House Staff and Fellows in Clinical Departments and Divisions,
1932 and 1982

	1932			1982				
	Interns, total	Residents SUH*	Residents, total	Interns, SUMC#	Interns, total	Residents, SUMC	Residents, total	Fellows, total
Anesthesia					4	19	32	8
Dermatology						6	15	5
Gynecology/Obstetrics	3	2	4			10	18	5
Internal Medicine	6	5	9	14	22	28	39	136
Neurology		1	1			7	14	6
Pathology				3	4	8	12	27
Pediatrics		2	3	7	13	16	30	25
Psychiatry		1	1	2	6	7	32	17
Radiology, General Diagnostic		1	1			18	25	3
Radiology, Therapy						13	13	
Radiology, Nuclear Research						3	3	4
Radiobiological Research								6
Surgery, Cardiovascular						7	7	3
Surgery, General	4	3	4	14	16	11	88	6
Neurosurgery						3	3	
Ophthalmology		2	2			5	5	1
Orthopedics						6	6	1
Otorhinolaryngology		2	3			4	4	
Plastic Surgery						4	4	1
Urology						3	3	1
TOTALS	13	19	28	40	65	178	353	255

*SUH = Stanford University Hospitals, San Francisco

#SUMC = Stanford University Medical Center

Table IV.
Fellowship Assignments, 1982

Preclinical Departments	117
Biochemistry 42, Genetics 22, Laboratory Animal 1, Medical Microbiology 8, Neurobiology 20, Pharmacology 6, Physiology 5, Structural Biology 13	
Clinical Departments	255
Anesthesiology 8, Dermatology 5, Ob/Gyn 5, Internal Medicine 136 (Cardiology 32, Clinical Pharmacology 13, General Internal Medicine 2, Gastroenterology 11, Gerontology 5, Hematology 8, Immunology 17, Infectious Diseases 10, Metabolism 8, Nephrology 7, Oncology 9, Respiratory Medicine 4, Miscellaneous 10), Neurology 6, Pathology 27, Pediatrics 25, Psychiatry 17, Radiology 13 (Diagnostic 3, Nuclear 4, Radiobiologic Research 6), Surgery 13 (Cardiovascular 3, General 6, Ophthalmology 1, Orthopedics 1, Plastic 1, Urology 1)	
TOTAL	372

Table V. Outpatient Visits from Perspective of 1932-3

	1932-3 Visits				Disposition *		1981-2 Visits	
Clinics	New Referral Transfer	Total	Home Visits	To SFH	To Lane	New	Total	
Children's	1,241	13,939	2,394	19	284	748	12,844	
Dental	771	1,795			1			
Medical, General	3,391	18,567	626	163	422	1,958	9,552	
Chest	270	1,537	2,155	38	27	123	882	
Syphilis	736	27,445	961	15	7			
Skin	1,376	6,055		15	11	2,841	12,364	
Neuropsychiatry	821	18,243	320	5	170	2,089	17,696	
Women's	1,582	13,818	6,948	98	557	1,904	11,037	
Surgical, General	2,687	16,977	22	186	201	1,054	5,325	
ENT	2,681	14,621	6	342	452	1,674	10,257	
Eye	2,099	12,681	9	28	165	2,287	11,387	
Men's	1,039	19,095	3	56	56	1,130	5,450	
Orthopedic	831	4,049	3	32	46	829	4,235	
TOTAL	19,525	168,821	13,447	997	2,399	16,637	101,02	
Other clinics, 1981-2						5,842	40,378	
TOTAL						22,479	141,407	
Daily Average	64	550				87	554	

*SFH = San Francisco City and County Hospital; Lane = Stanford's Lane Hospital

Note: Daily averages calculated on basis of 307 available days annually in 1932-3, 260 days in 1981-2

Table VI.
Outpatient Visits from Perspective of 1981-2

Clinics	1981-2 Visits		1932-3 Visits	
	New	Total	New	Total
Anesthesia: Nerve Block	23	1,651		
Cardiovascular Surgery	619	2,505		
Dermatology	2,841	12,364	1,376	6,055
Gynecology		7,020		
	1,904		1,582	13,818
Obstetrics		4,017		
Medicine, General Internal	1,958	9,552	3,391	18,567
Oncology	693	9,754		
Stanford Medical Group	567	3,281	*771	*1,795
Ten Medical Subspecialties	5,378	35,695	#736	#27,445
Neurology	843	3,741		
Pediatrics (15 Subspecialties)	748	12,844	1,241	13,938
Psychiatry	755	12,059	**821	**18,243
Sleep Clinic	491	1,896		
Surgery, General	1,054	5,325	2,687	16,977
ENT/Audiology	1,674	10,257	2,681	14,621
Eye	2,287	11,387	2,099	12,681
Neurosurgery	1,018	3,673		
Orthopedics	829	4,235	831	4,049
Pediatric Surgery		1,015		
Plastic/Reconstructive	866	5,727		
Thoracic		546	##270	##1,537
Urology	1,130	5,450	1,039	19,095
Surgery, Total	8,858	47,615	9,607	68,960
TOTALS	22,479	141,407	19,525	168,821

* = Dental Clinic

= Syphilis Clinic

** = Neuropsychiatry

= Medical Chest Clinic

Table VII.
Traffic in Hospital Beds, circa 1932 and 1982

	1932-3		1981-2	
	Lane	Stanford	Medical Center	
Patients admitted				
Towards	3,441	2,257		
To rooms	480			
Infants	294	140		
TOTALS	4,215	2,397	g 26,842	
	Lane		SUMC	
	Ward		Beds	
	Beds			
Patient days				
Medical/Surgical			477	129,441
Medicine, general	31	6,147		
Dermatology		70		
Neuropsychiatry	a 12	4,023	a 20	a 5,771
Pediatrics	38	2,567	34	8,848
Obstetrics/infants	27	2,935	b 34	c 6,395
Obstetrics		3,054	32	8,893
Gynecology		2,616		
Surgery, general	40	6,999		
Ophthalmology		1,134		
Orthopedics		1,003		
Otolaryngology		1,569		
Urology		1,443		
Guests		102		
Intensive Care				
Newborn Nursery			25	10,755
Pediatric ICU			10	2,375
Adult ICU			d 57	14,112
Cardiac Care Unit			8	1,434
TOTALS	e 340	33,560	f 697	g 188,024

Average patients daily	92	59	g 515
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Average length of stay, days	8.0	9.0	9.6
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a: Psychiatry

b: Bassinets

c: Normal newborns

d: includes a 25-bed cardiovascular intensive care unit

e: Includes other Stanford Hospital beds, but excludes 266 beds at San Francisco City and County Hospital (142 medical, 14 bassinets, 27 pediatrics, 83 surgical)

f: includes bassinets

g: Includes normal newborns.

Table VIII.
U.S.A. Mortality Rates, 1931 and 1977

	1931 930.8/100,000		1977 878.1/100,000	
	Rank	%	Rank	%
Heart Diseases	1	21.7	1	37.8
Influenza and Pneumonia	2	11.6	5	2.7
Malignancies	3	10.6	2	20.4
Nephritis	4	9.4	13	0.4
Cerebrovascular Diseases	5	8.5	3	9.6
Accidents	6	8.2	4	5.4
Tuberculosis	7	7.3		
Congenital Malformations and Disorders of Early Infancy	8	6.1	6	2.2
Diarrhea and Enteritis	9	2.2		
Diabetes Mellitus	10	2.2	7	1.7
Ill-Defined Causes	11	2.0		
Suicide	12	1.8	9	1.5
Selected Infections*	13	1.7		
Appendicitis	14	1.7		
Puerperal Sepsis, etc.	15	1.2		
Hernia and Intestinal Obstruction	16	1.1		
Homicide	17	1.0	12	1.0
Cirrhosis of Liver	18	0.8	8	1.6
Typhoid and Paratyphoid Fever	19	0.5		
Bronchitis and Chronic Pulmonary Diseases	20	0.4	11	1.2
Arteriosclerosis			10	1.5

*Erysipelas, malaria, measles, meningitis, pertussis, scarlet fever, smallpox

Table IX.
Faculty, House Staff and Fellows in 1958-9

	Fulltime				Voluntary Clinical									
	Professor	Associate Assistant	Instructor		Professor	Associate Assistant	Instructor		Teaching Assistants	Research Associates and Assistants	Residents	Assistant Residents	Interns	Fellows
Anatomy	5	3	3				10		8					
Anesthesia											2	6		
Biochemistry	2													
Dermatology											1	3		3
Family, Community & Preventive Medicine	2	3	1		2	1	1	2	2	2				
Gynecology/Ostetrics	1	2	1		3	5	9	12	17		1	12		
Medical Microbiology	3	1	1	1		1	1		1	5				1
Medicine	8	3	3	3	12	27	55	84	53	17	1	21	7	6
Neurology											1	1		1
Pathology	2			3			4	2	2	1	1	2		1
Pediatrics	3	3	2			8	10	24	11	2	2	11	1	2
Pharmacology	3		1	2						11				2
Physiology	3	1		1				1		5				
Psychiatry	2	3		4		9	8	20	1	4	1	8		4
Radiology	1	3	2	3	2	2	6	11	3	15	2	11		7
Speech Pathology & Audiology	2		2	1										
Surgery, General	5	3	2	2	15	22	47	105	33	12	2	18	6	7
ENT											1	1		
Eye											1	2		
Orthopedics											1	2		
Urology											2	5		
TOTALS	42	22	18	23	34	75	141	271	123	82	19	103	14	34

Table X.
Faculty and Fellows in 1959-60

	Fulltime				Voluntary Clinical						
	Professor	Associate	Assistant	Instructor	Professor	Associate	Assistant	Instructor	Teaching Assistants	Research Associates and Assistants	Fellows
Anatomy	4		3	3				9	1	5	
Biochemistry	2	2	3							5	7
Family, Community & Preventive Medicine	2	3	1		1	2	1	2	3		
Genetics	1		1							3	8
Gyn/Ob	1	2	1		2	4	9	12	18	1	
Medical Microbiology	3	2	1	1		1	1		1	7	
Medicine	8	3	2	3	12	31	79	97	70	13	9
Pathology	2	1	1	2			2	6	3	2	
Pediatrics	3	3	2	4	1	7	14	24	38	4	3
Pharmacology	3	1	2	1						7	2
Physical Therapy	1	2		2		2	1	2			
Physiology	2	1		2				1	2	2	
Psychiatry	2	4	1	1		12	11	28	6	4	
Radiology	1	3	4	3	2	2	7	12	2	11	7
Speech Pathology & Audiology	2		2	1			1	1			
Surgery	6	2	2	2	14	22	45	115	39	15	
TOTALS	43	29	26	25	32	83	171	309	183	79	36

Appendix C

Faculty at Stanford for Class of 1933

<u>Rank</u>	<u>Name</u>	<u>Degree</u>	<u>Year</u>	<u>Institution</u>	<u>Stanford</u> <u>Since</u>
ANATOMY					
Professor	Arthur W. Meyer	M.D.	1905	Johns Hopkins	1909
	Charles H. Danforth	Ph.D.	1912	Washington	1922
	Frank M. McFarland	Ph.D.	1896	Würzburg	1892
	Clara S. Stoltenberg	A.M.	1897	Stanford	1896
BACTERIOLOGY AND EXPERIMENTAL PATHOLOGY					
Professor	Edwin W. Schultz	M.D.	1917	Johns Hopkins	1920
	Wilfred H. Manwaring	M.D.	1904	Johns Hopkins	1913
Assistant Professor	Charles E. Clifton	Ph.D.	1928	Minnesota	1929
CHEMISTRY					
Professor	Robert E. Swain	Ph.D.	1901	Yale	1898
Assistant Professor	J. Murray Luck	Ph.D.	1925	Cambridge	1926
MEDICINE					
Professor	Arthur L. Bloomfield	M.D.	1911	Johns Hopkins	1926
	Thomas Addis	M.D.	1908	Edinburgh	1911
	George DeForest Barnett	M.D.	1913	Stanford	1915
	W. Edward Chamberlain	M.D.	1916	California	1920
	Henry G. Mehrtens	M.D.	1913	Stanford	1915
	Robert R. Newell	M.D.	1916	California	1920
Associate Professor	William Dock	M.D.	1922	Rush	1926
	Harry L. Langnecker	M.D.	1906	Johns Hopkins	1915
	Harry A. Wyckoff	M.D.	1916	Stanford	1919
Assistant Professor	John Kent Lewis	M.D.	1922	Stanford	1923
Instructor	Charles W. Barnett	M.D.	1927	Harvard	1927
	Edward Leef	M.D.	1926	Minnesota	1930
	Helen Marshall	A.M.	1918	Ohio State	1921

	Dorothy J. Starks	M.D. 1928	Stanford	1930
Clinical Professor	Harry E. Alderson	M.D. 1900	California	1912
	William F. Cheney	M.D. 1889	Cooper	1909
	William R.P. Clark	M.D. 1899	Cooper	1911
	Harold P. Hill	M.D. 1901	California	1912
	Walter F. Schaller	M.D. 1902	Cooper	1911
Associate				
Clinical Professor	Philip H. Pierson	M.D. 1913	Harvard	1916
	J. Marion Read	M.D. 1915	Stanford	1916
	Julian M. Wolfsohn	M.D. 1911	Johns Hopkins	1913
Assistant				
Clinical Professor	Samuel H. Hurwitz	M.D. 1912	Johns Hopkins	1926
	Russell V. A. Lee	M.D. 1920	Stanford	1921
Clinical Instructor	Garnett Cheney	M.D. 1923	Harvard	1925
	Kenneth D. Gardner	M.D. 1927	Stanford	1932
	Leo H. Garland	M.D. 1924	Dublin	1928
	A. Carol McKenney, Jr.	M.D. 1925	Stanford	1926
Lecturer	Morton R. Gibbons	M.D. 1897	Cooper	1919

OBSTETRICS AND GYNECOLOGY

Professor	Albert B. Spalding	M.D. 1900	Columbia P & S	1912
Associate Professor	C. Frederic Fluhmann	M.D. 1922	McGill	1926
Associate				
Clinical Professor	Ludwig A. Emge	M.D. 1914	Rush	1917
	Karl L. Schaupp	M.D. 1916	Stanford	1918

PATHOLOGY

Professor	William Ophüls	M.D. 1895	Göttingen	1909
Instructor	Edward M. Butt	M.D. 1929	Stanford	1926
Assistant	David A. Wood	M.D. 1930	Stanford	1928

PEDIATRICS

Professor	Harold K. Faber	M.D. 1911	Michigan	1915
Associate Professor	Lloyd B. Dickey	M.D. 1923	Minnesota	1923
Associate				
Clinical Professor	Mary H. Layman	M.D. 1913	Ludwig-	
			Maximilian	1917
Assistant				
Clinical Professor	J. Clifford Parrott	M.D. 1920	Stanford	1927

	Roland P. Seitz	M.D. 1923	Stanford	1924
Clinical Instructor	Esther B. Clark	M.D. 1925	Stanford	1930
Lecturer	Adelaide Brown	M.D. 1892	Cooper	1920

PHARMACOLOGY AND THERAPEUTICS

Professor	Paul J. Hanzlik	M.D. 1912	Western Reserve	1921
Associate Professor	Maurice L. Tainter	M.D., 1925	Stanford	1924
Instructor	Andrew B. Stockton	M.D. 1928	Stanford	1926

PHYSIOLOGY

Professor	Ernest G. Martin	Ph.D. 1904	Johns Hopkins	1916
	Frank W. Weymouth	Ph.D. 1923	Stanford	1910
Associate Professor	James P. Baumberger	D. Sc. 1916	Harvard	1919
	George D. Shafer	Ph.D. 1908	Cornell	1918
Assistant Professor	John Field, II	Ph.D. 1928	Stanford	1923
	Victor E. Hall	M.D. 1928	Stanford	1925

PUBLIC HEALTH AND PREVENTIVE MEDICINE

Professor	Ernest C. Dickson	M.D. 1917	Toronto	1910
Instructor	Harold C. Chope	A.B. 1926	Stanford	1928
Assistant				
Clinical Professor	William W. Reich	M.D. 1929	Stanford	1927

SURGERY

Professor	Emile F. Holman	M.D. 1918	Johns Hopkins	1925
	Leonard W. Ely	M.D. 1895	Columbia P & S	1913
	Frederick L. Reichert	M.D. 1920	Johns Hopkins	1926
Professor Emeritus	Emmet Rixford	M.D. 1891	Cooper	1909
Instructor	Curtis B. Gorham	M.D. 1928	Stanford	1928
	Nelson J. Howard	M.D. 1925	Johns Hopkins	1927
	Robert Scarborough	M.D. 1926	Yale	1928
Clinical Professor	Leo Eloesser	M.D. 1907	Heidelberg	1913
	Hans Barkan	M.D. 1910	Harvard	1914
	James R. Dillon	M.D. 1912	Cooper	1913
	Philip K. Gilman	M.D. 1905	Johns Hopkins	1916
Associate				
Clinical Professor	Caroline B. Palmer	M.D. 1906	Cooper	1916

Clinical Instructor	Loren R. Chandler	M.D.	1923	Stanford	1923
	Gunther W. Nagel	M.D.	1921	Stanford	1928
	William L. Rogers	M.D.	1926	Stanford	1927
On leave	Carleton Mathewson, Jr.	M.D.	1927	Stanford	1933

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